WIN A Dream Computer System!! see page 85.

All-Time Best-Selling Commodore Games

COMPUTE!'s GAZETTE

$3.00
December 1987
Issue 54, Vol. 5, No. 12
ISSN 0737-3716
02220 $4.25 Canada

FOR **COMMODORE** PERSONAL COMPUTER USERS

Crossroads

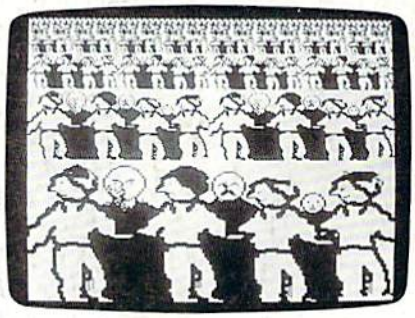
One of our finest Commodore 64 arcade-style games ever—packed with variety, nonstop action, and constant challenge.

RAPID Disk TRANSIT

The fastest file copier we've ever published—and easy to use. For the 64.

Also In This Issue:

Instant-80 For *SpeedScript*
Keyfig Your CP/M Keyboard
The *GEOS* Column: Trash Restorer
Software Reviews
And More

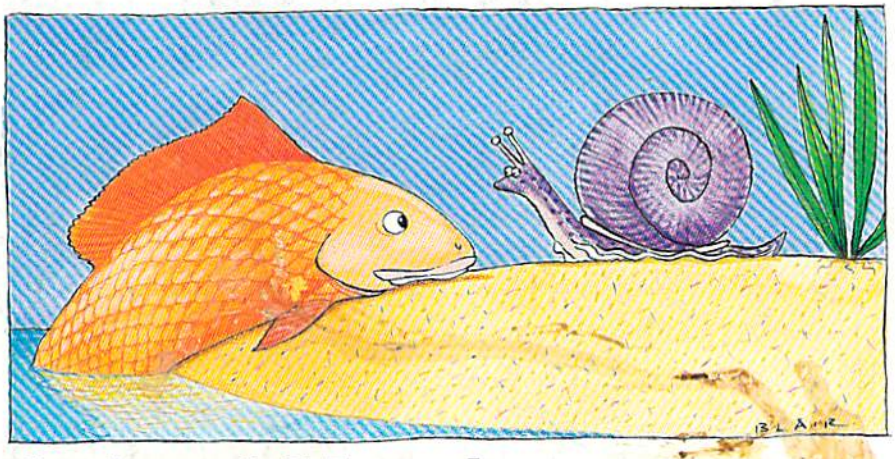


Grafnastics

Fine-tune your 64 graphics for world-class performance.

PrintScreen

All you could want from a screen dump—redefined characters, hi-res graphics, even sprites.



Animal Match

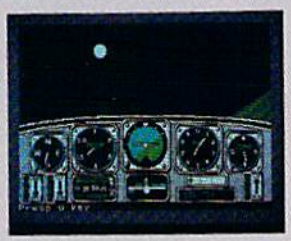
A memory game for the 64 with great graphics and sound for players of all ages.

12
0 71486 02220 6

"Finally, The Right Stuff"

–NY Times *(Aug. 25, 1987)*

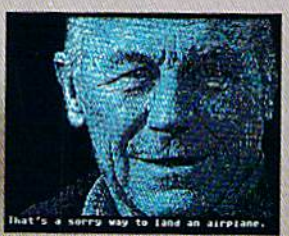
Strap yourself into Chuck Yeager's Advanced Flight Trainer.™ The only flight simulation co-designed by the greatest test pilot ever. And with action so fast, even experienced pilots 'auger in.' The right stuff is right here.



Test the limits of 14 different aircraft using Yeager's own evaluation checklist. From the classic WWI Sopwith Camel to the mach-speed SR-71 Blackbird. Push the experimental XPG-12 to the edge of space.

Fly formation on Yeager's wing through Dead Man's Slalom. Catch the breathtaking fear of a Hammerhead stall, the adrenaline rush of an aileron roll, the thrill of your first Cuban 8.

Race computer opponents through white-knuckle courses. Bolt past obstacles and run narrow gates. Skim the ground at top speed, wing-to-wing with your rival. View the action from a chase plane or the tower.



Seat-of-the-pants flying in the only simulation with over forty years of experience. Yeager insisted on actual aircraft specs and his own flight evaluation charts. Climb into the cockpit and see if you've got the 'right stuff.'

HOW TO ORDER: Visit your retailer or call 800-245-4525 for direct VISA or MasterCard orders (in CA call 800-562-1112). The direct order price is $39.95 for the IBM version and $34.95 for the C64 version. Send a U.S. check or money order to Electronic Arts Direct Sales, P.O. Box 7530, San Mateo, CA 94403. Add $3 for shipping and handling ($5 Canadian). Please allow 1-2 weeks for U.S. delivery. Coming for the Apple II. IBM is a registered trademark of International Business Machines, Inc. C64 is a registered trademark of Commodore Electronics Limited. Software © 1987 Ned Lerner.

ELECTRONIC ARTS®

PHOTO COURTESY NORTHROP AVIATION/ALLEN QUINN.
Headline quote © 1987 by The New York Times Company. Reprinted by permission.

ST MADE
AGE NEWS.

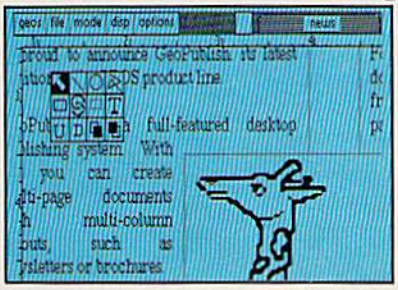
These days, the biggest story in the news is geoPublish. The page-making program for GEOS-equipped 64's and 128's that replaces lifeless layouts with page after page of powerful, punchy professionalism.

Freedom of the press.

Actually, geoPublish is very patriotic software. After all, what other application guarantees your freedom of self-expression? Well, geoPublish sure does. In fact, every piece it prints is dedicated to the preservation of your personality on paper.

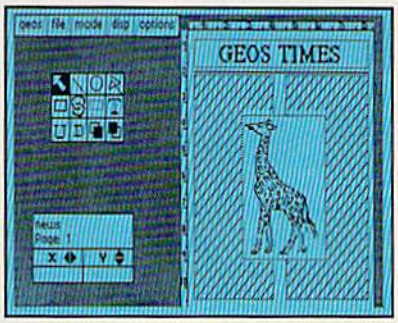
Which means that finally, your newsletters never need to look like anyone else's, ever again.

All you do is draw a bunch of columns for your master layout. They could be two, four or sixteen across the page. They could be short and squat, or long and skinny. It's your call. After that, you just "pour" your geoWrite document, text, graphics and all—into column after column. Page after page.



Everything fills up automatically until it fits firmly into your finely fashioned format.

Extras! Extras! Read all about 'em!



As every editor knows, even the best stories need punching up before they go to press. Which is why geoPublish features an array of artistic appliances designed to earn your pages a place in the history books.

You can resize text. Change fonts. Even insert or delete graphics anywhere on the page. You can lay text over graphics. Graphics over text. Or even wrap text *around* graphics.

And if your image doesn't fit, no problem. The proportional scaling tool can shrink or enlarge any art, be it your original or the stuff you find in Print Shop.™

Finally, those of you intent on making banner headlines should know that geoPublish doesn't wimp out when it comes to headlines. It screams them out, with genuine, newspaper-sized, 96 point megafonts.

Now, if you think that sounds terrific on paper, just wait until you see it printed out on a Laser-Writer.™

We've saved the best news for last.

And now, for the best part: you can create and save not one, but hundreds of layouts for later use.

And because it's part of the GEOS family, you can fully integrate text and graphics from all your other programs into every geoPublish piece you print.

So now that you know the latest scoop in software, why not subscribe to geoPublish yourself? Who knows? With stuff like this, you could be making front page news in no time.

To order call 1-800-443-0100 ext. 234

geoPublish $69.95

(California residents add 7% sales tax.)

$2.50 US/$5.50 Foreign for shipping and handling. Allow six weeks for delivery.

Commodore and Commodore C64 are trademarks of Commodore Electronics, Ltd. GEOS, geoPublish and Berkeley Softworks are trademarks of Berkeley Softworks.

GEOPUBLISH

Berkeley Softworks

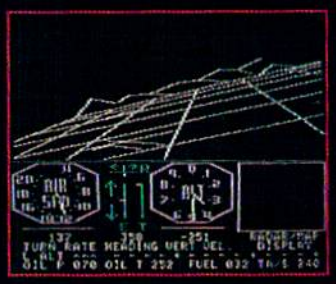
The brightest minds are working at Berkeley.

1987 - Expanding Scenery disk coverage; East Coast, Japan, & Europe

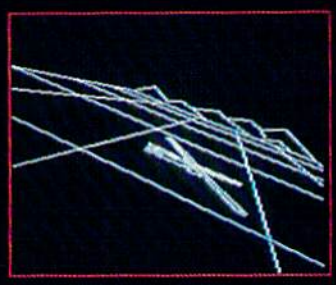
1986 - Flight Simulator II for the 68000 computers

1985 - High-performance Jet flight simulator for the IBM, Commodore 64, and Apple II computers

1982/1983 - Microsoft Flight Simulator & Flight Simulator II



1979 - 3D graphics applied to the original FS1 Flight Simulator for the new Apple II and TRS-80 computers



1977 - SubLOGIC's 3D graphics package in BASIC and M6800 Assembly Language

Ten Years of Technology and Dedication

Some say our technology has helped us define the state of the art in flight simulation. We believe our ten years of dedication have gotten us where we are today.

SubLOGIC's first black & white 3D graphics routines, developed in 1977, paved the way for our introduction to flight simulation and aerial combat gaming theory. Our second-generation Flight Simulator II was so well conceived that even we find it difficult to improve upon. Jet's spectacular land and sea battle scenarios set another classic milestone in state-of-the-art simulation gaming. Scenery concepts incorporated into SubLOGIC flight simulation products right from the start continue to evolve as we introduce new, more beautifully detailed areas of the world to explore. And coming in 1988 - a flight control yoke for even more realism!

We invite you to help us celebrate our first decade of success, and share in our anticipation of the next ten years to come. SubLOGIC tenth-anniversary promotional shirts and posters are available at your dealer or directly from SubLOGIC. See your dealer, or write or call us for more information.

subLOGIC Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995
ORDER LINE: (800) 637-4983
(except in Illinois)

GAZETTE contents

December 1987 Vol. 5, No. 12

features

Best Sellers! Commodore Games That Live On and On *Keith Ferrell* . . . . . 18 *
Gazette Readership Survey . . . . . 24 *

reviews

EOS: Earth Orbit Stations *James V. Trunzo* 28 64
Dan Dare: Pilot of the Future *Neil Randall* 30 64
1541/1571 Drive Alignment System *Art Hunkins* 31 128/64
Street Sports Baseball *Robert Bixby* 32 64
The Advanced OCP Art Studio *Robin and David Minnick* 34 64

games

Crossroads *Steve Harter* 38 64
Snake Pit *Michael L. Hall* 42 64
Root Race *Sean D. Wagle* 44 64

education/home applications

Word Find *Keith Murray* . . . . . 46 128/64/+4/16
Animal Match *David Wright* 48 64
Computing for Families: So Where Is the Robot? *Fred D'Ignazio* 68 64

programming

Machine Language for Beginners: Strings *Richard Mansfield* 54 128/64
BASIC for Beginners: Working with Strings *Larry Cotton* . . . . . 58 128/64/+4/16
Hints & Tips: Quick and Easy . . . . . 70 128/64/+4/16
Power BASIC: Power Pause *James Host* 74 128/64
Instant-80: True 80-Column Preview for *SpeedScript* *Glen Mackinnon* 76 64
Customize Your 128's CP/M Keyboard *James Adams* 82 128
Grafnastics *Robert Bixby* 88 64
Disk Rapid Transit *Ken Turcotte* 91 64
Dynamic Screen *André Delisle* . . . . . 92 128/64/+4/16
PrintScreen *James Host* 93 64

departments

The Editor's Notes *Lance Elko* . . . . . 6 *
Gazette Feedback *Editors and Readers* . . . . . 10 *
The *GEOS* Column: More on Strings *John Howard* 52 64
Simple Answers to Common Questions *Tom R. Halfhill* . . . . . 56 *
Horizons: What Is This, the Runaround? *Todd Heimarck* . . . . . 62 *
User Group Update *Caroline D. Hanlon* . . . . . 86 *
Bug-Swatter: Modifications and Corrections . . . . . 111 *
News & Products . . . . . 112 *

program listings

How to Type In COMPUTE!'s Gazette Programs . . . . . 138 *
The Automatic Proofreader 140 128/64
MLX: Machine Language Entry Program for Commodore 64 . . . . . 142 64
Advertisers Index . . . . . 148 *

*=General, **64**=Commodore 64, **+4**=Plus/4, **16**=Commodore 16, **128**=Commodore 128

COMPUTE!'s GAZETTE is published monthly by **COMPUTE!** Publications, Inc., 825 7th Avenue, New York, NY 10019 USA. Phone: (212) 265-8360. Editorial offices are located at 324 West Wendover Avenue, Greensboro, NC 27408. Domestic Subscriptions: 12 issues, $24. POSTMASTER: Send address changes to *COMPUTE!'s GAZETTE*, P.O. Box 10957, Des Moines, IA 50340. Second class application pending at Greensboro, NC 27403 and additional mailing offices. Entire contents copyright ©1987 by **COMPUTE!** Publications, Inc. All rights reserved. ISSN 0737-3716.
COMPUTE! Publications, Inc. is part of ABC Consumer Magazines, Inc., one of the ABC Publishing Companies: ABC Publishing, President, Robert G. Burton; 1330 Avenue of the Americas; New York, New York 10019.

editor's notes

As we are about to enter 1988, our fifth year of GAZETTE publication, we would like to thank you for your continued support and enthusiasm. The mail, programs, and articles we receive constantly reflect your strong interest and involvement. Despite the thousands of quality programs published commercially and in Commodore-specific magazines over the years, we still see increasingly innovative and unique programs—and this is exemplified in this issue, perhaps our best bundle of Commodore software in any of our 1987 issues.

The theme of this issue is games, and we've assembled a group that will appeal to players of all interests, ages, and skill levels. "Crossroads," in the opinion of many here, is the best 64 arcade-style shoot-'em-up we've ever published. In terms of playability, challenge, and action, it rivals many commercially successful games. "Snake Pit," for one or two players, adds some interesting new twists to the popular *Blockade* genre of action games. The graphics are excellent, and, at the higher speed levels, Snake Pit will challenge even the best arcade player. For those who prefer strategy to action, the unique and clever "Root Race" fits the bill. Both children and adults will enjoy "Animal Match," which features outstanding graphics and sound and is a fine educational tool. And for word puzzle buffs, there's "Word Find."

Over the years, GAZETTE has offered a number of applications and utilities that have proven very popular with our readers—*SpeedScript*, "MetaBASIC," "TurboDisk," and "Ultrafont+," to name a few. This issue features several programs that would make our "best utilities" list. "Disk Rapid Transit" is a file copier—for BASIC or machine language programs—that rivals and even surpasses many commercially available ones. It's lightning fast and very easy to use. It works with one or two 1541 or 1571 disk drives, and it can copy a 130-block file in only 35 seconds (five times faster than the built-in DOS routines of the 1541).

"PrintScreen" is easily the most comprehensive 64 screen dump we've published. It prints out screens with redefined characters, hi-res graphics, and sprites. And it works with most popular printers. It can be used with this month's "Power BASIC" offering, "Power Pause," which, with the press of a key, freezes your screen whether a listing is scrolling by or you're in the middle of an action game.

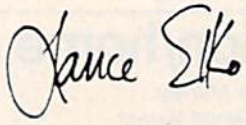
If your interest lies in 64 graphics, "Grafnastics" is a must. This program takes your hi-res art and offers you unique creative control for a multitude of special effects. Included are features such as mirror, reverse, rotate, and perspective.

Next month, the 64 version of *SpeedScript* will be four years old. But user interest has by no means waned. We still receive a large number of *SpeedScript* enhancers and support utilities, the best of which we publish every few months. This issue includes "Instant 80," which adds a fast, true 80-column preview to *SpeedScript* documents.

While Charles Brannon's *SpeedScript* has made its fair donation to Commodore archives, so has another GAZETTE feature: Richard Mansfield's column,"Machine Language for Beginners." This has been a regular part of GAZETTE since the first issue, July 1983. This month marks his final column. As frequently happens with changing roles, his recent promotion to vice president/editorial director for COMPUTE! Publications is requiring more and more of his time. We know from reader mail that his column has served many of you well and has consistently clarified one of the most difficult areas of programming. But we're not abandoning the topic. Next month's issue will debut a new column, "Machine Language Programming" by Associate Editor Jim Butterfield. As many of you know, Jim has been a key figure in the Commodore community since 1979. Jim will focus on various areas of ML programming, some for beginner levels, some for advanced.

While planning this issue's main feature—"Best Sellers! The Commodore Games That Live On and On"—it occurred to us that we were just as curious about the topic as any of our readers could be. What are the all-time best-selling games for the Commodore 64? Keith Ferrell, our features editor, posed this question to 13 leading software publishers, and the results, in many cases, were surprising.

In 1988, we'd like to get to know you better. On page 24, you'll find the "GAZETTE Readership Survey," a questionnaire for all interested readers. With the compiled information from the responses, we can get direct feedback from you, enabling us to better meet your interests in 1988. We're looking forward to hearing from you. Have a safe and happy holiday season.



Lance Elko
Editor

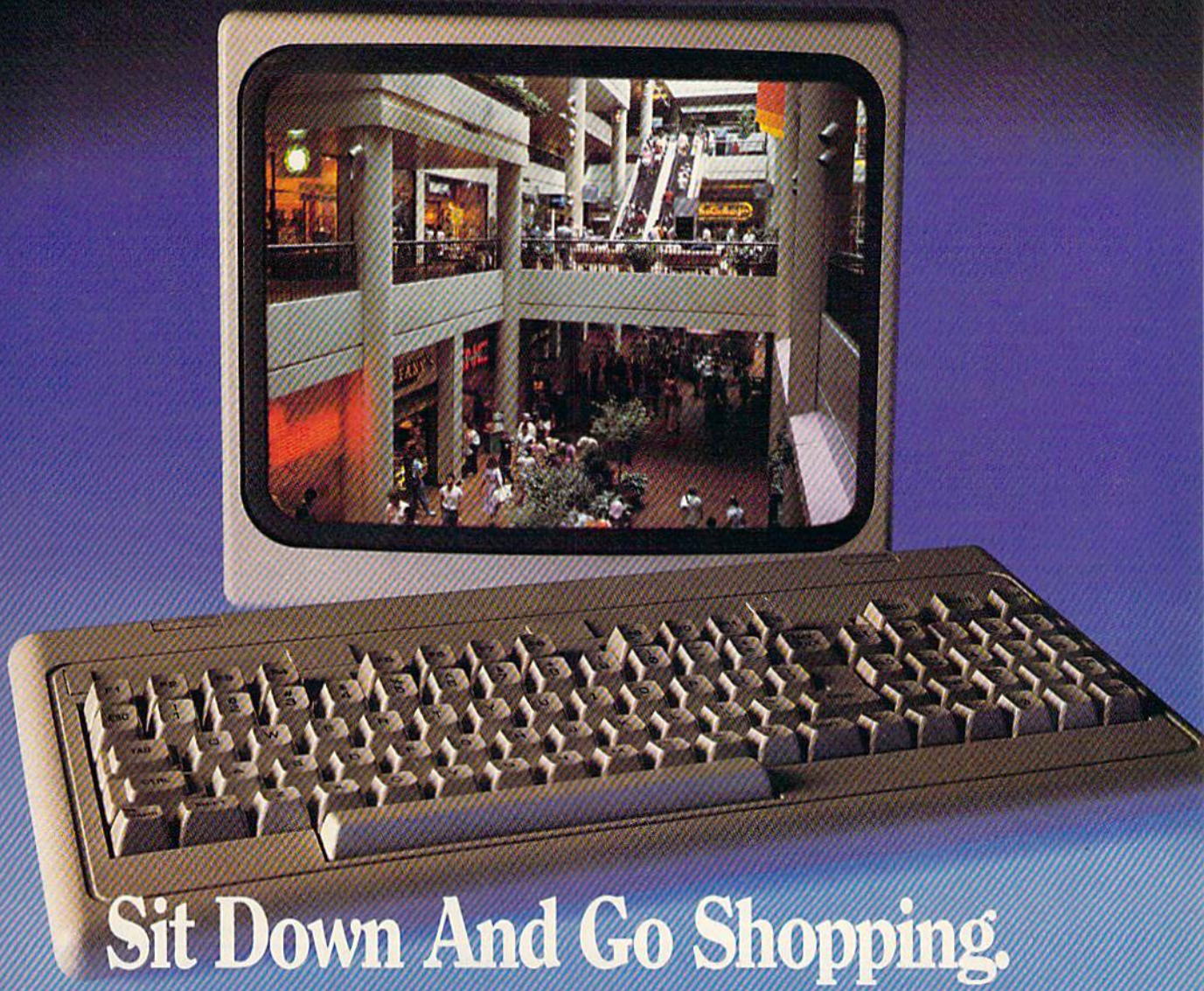
COMPUTE! Publications, Inc., is seeking to fill the following in-house editorial positions:

Assistant Technical Editor—Requires extensive experience with microcomputers, knowledge of machine language. Experience or training in editing or writing. Undergraduate degree preferred, experience in lieu of degree considered.

Microcomputer Programmer—Requires proficiency on one or more of the following computers: IBM-PC, Apple, Commodore, Atari. College degree preferable with coursework in BASIC. Proficiency in BASIC programming. Extensive machine language experience a plus.

Send résumé and salary history in confidence to:

Personnel Department
COMPUTE! Publications, Inc.
P.O. Box 5406
Greensboro, NC 27403



Sit Down And Go Shopping.

CompuServe takes you on a coast-to-coast shopping spree from the comfort and convenience of your home.

Now you can shop the entire country through THE ELECTRONIC MALL™ from CompuServe. Stop in online at Waldenbooks, Express Music, even the Metropolitan Museum of Art. It's an easy and exciting way to buy goods and services from the nation's top merchants and businesses without ever having to leave home.

Plan your shopping adventure by department: Apparel & Accessories, Automotive, Books & Periodicals, Gifts & Novelties, Computing, Gourmet & Flowers, Hobbies & Toys, Merchandise & Electronics, Online Services, Premium Merchants, Music & Movies, Health & Beauty, Financial, Travel & Entertainment, Office & Supplies, Sports & Leisure.

You can also join Comp-u-store, a computerized discount shopping service. Access over 250,000 products with savings of up to 50%.

Take the 15-Minute Shopping Comparison Test:

Here's what you can do in 15 minutes shopping THE ELECTRONIC MALL way:

- Look up the latest in computer accessories.
- Select one and enter the order command.
- Shop for unusual and unique gifts for every member of the family.
- Get information on that new car you've been thinking about buying.
- Request a department store catalog. Pick out a new wardrobe. Toys. Tools. Anything you wish.
- Place your order.

Compare all that with what you can do in 15 minutes of shopping the old way:

- Round up the family and get in the car.

THE ELECTRONIC MALL—another valuable service from the vast world of CompuServe.

Only CompuServe subscribers can shop online in the fabulous ELECTRONIC MALL. So join now and find an exciting selection of top-quality merchandise and useful product information services 24 hours a day, seven days a week.

CompuServe Information Services bring you information, entertainment, personal communications and more. You can access CompuServe with almost any computer and modem.

Start your own cross-country shopping spree today. To buy a CompuServe Subscription Kit, see your nearest computer dealer. To receive our informative brochure or to order direct, call or write.

CompuServe®

Information Services, P.O. Box 20212
5000 Arlington Centre Blvd., Columbus, OH 43220

800-848-8199

In Ohio and Canada, call 614-457-0802

An H&R Block Company

COMPUTE! Publications, Inc.
One of the ABC Publishing Companies

Publisher	James A. Casella
Editorial Director	Richard Mansfield
Managing Editor	Kathleen Martinek
Associate Publisher	Selby Bateman
Editor, COMPUTE! and COMPUTE!'s Gazette	Lance Elko
Assistant Editors, COMPUTE! and COMPUTE!'s Gazette	Rhett Anderson, Randy Thompson, Clifton Karnes
Production Director	Tony Roberts
Editor, COMPUTE!'s Atari ST Disk & Magazine and COMPUTE!'s PC Magazine	Tom R. Halfhill
Editor, COMPUTE!s Apple Applications Magazine	Gregg Keizer
Features Editor	Keith Ferrell
Technical Editor	Ottis R. Cowper
Assistant Technical Editors	Dale McBane, Jim Fuchs
Assistant Editor, COMPUTE!'s Atari ST Disk & Magazine	Todd Heimarck
Assistant Editor	John Shadle
Assistant Features Editor	Tom Netsel
Programming Supervisor	Patrick Parrish
Editorial Programmers	Tim Victor, Tim Midkiff, William Chin, George Miller
Buyer's Guide Coordinator	Caroline Hanlon
Copy Editors	Karen Uhlendorf, Karen Siepak, Jill Champion, Lori Sonoski
Editorial Assistant	Mickey McLean
Submissions Reviewer	David Hensley
Programming Assistants	Troy Tucker, Joyce Sides
Executive Assistant	Debi Nash
Administrative Assistants	Julia Fleming, Iris Brooks, Sybil Agee, Claudia Earhart
Receptionist	Anita Armfield
Associate Editors	Jim Butterfield Toronto, Canada
	Fred D'Ignazio E. Lansing, MI
	David Thornburg Los Altos, CA
Contributing Editor	Bill Wilkinson
COMPUTE!'s Book Division Editor	Stephen Levy
Assistant Editors	Tammie Taylor, Robert Bixby, Lynne Weatherman, Forsyth Alexander
Programming Assistant	David Florance
Director of National Sales	Joseph W. Hatcher
Production Manager	Irma Swain
Art Director	Janice R. Fary
Assistant Art Director	Lee Noel, Jr.
Assistant Production Manager	De Potter
Designer	Tony Jacobson
Artists	Robin Case, Kim Potts, Scotty Billings
Typesetting	Terry Cash, Carole Dunton
Illustrator	Harry Blair
Group Advertising Director/ Consumer Electronics	Peter Johnsmeyer
Advertising Director	Bernard J. Theobald, Jr.
Production Coordinator	Kathleen Ingram
Customer Service Manager	Diane Longo
Dealer Sales Supervisor	Jose Cruz
Individual Order Supervisor	Cassandra Green

James A. Casella, Group Vice President
Richard Mansfield, Vice President, Editorial Director
Richard J. Marino, Vice President, Advertising Sales
Ilene Berson Weiner, Vice President, Production

Editorial Board
Richard Mansfield, Kathleen Martinek, Selby Bateman, Lance Elko, Tom R. Halfhill, Stephen Levy
Robert Lock, Founder and Editorial Consultant

COMPUTE! Publications, Inc. publishes:
COMPUTE! *COMPUTE! Books* *COMPUTE!'s Gazette*
COMPUTE!'s Gazette Disk *COMPUTE!'s Apple Applications*
COMPUTE!'s Atari ST Disk & Magazine *COMPUTE!'s PC Magazine*

Editorial offices:	324 West Wendover Avenue, Suite 200, Greensboro, NC 27408
Corporate offices:	825 7th Avenue, New York, NY 10019 212-265-8360
Individual Orders: (Single Copy)	800-346-6767 (In NY 212-887-8525) 10:00 AM–12:30 PM; 1:30 PM–3:00 PM Monday–Friday
Dealer Sales:	800-638-3822 (In NY 212-887-8566) 9 AM–5 PM Monday–Friday

Sales Representatives

Jerry Thompson	415-348-8222
Lucille Dennis	415-348-8222
Tom Link	212-315-1665
Harry Blair	919-275-9809

Address all advertising materials to:
Kathleen Ingram, COMPUTE!'s Gazette
324 West Wendover Ave., Suite 200, Greensboro, NC 27408

Sales Offices

Northeast	212-315-1665
Mid-Atlantic	212-315-1665
Southeast	919-275-9809

Sales Offices, Jules E. Thompson, Inc.
1290 Howard Avenue, Suite 303, Burlingame, CA 94010

Midwest	312-726-6047
Texas	713-731-2605
Pacific Northwest	415-348-8222
California	415-348-8222
Arizona	415-348-8222
New Mexico	415-348-8222
Colorado	303-595-9299

Subscription Orders and Inquiries

COMPUTE!'s GAZETTE
P.O. Box 10957, Des Moines, IA 50340

TOLL FREE
Subscription Order Line
1-800-727-6937

MPA

Member ABC
Audit Bureau of Circulations

COMPUTE!'s GAZETTE Subscription Rates

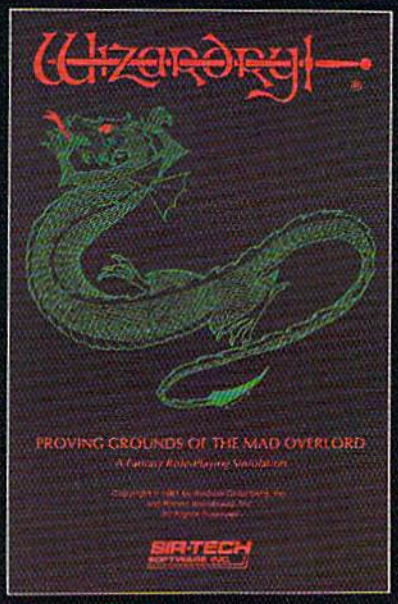
(12-Issue Year): US (one year) $24. Canada, Mexico and Foreign Surface Mail $30. Foreign Air Mail $65.

The COMPUTE!'s GAZETTE subscriber list is made available to carefully screened organizations with a product or service which may be of interest to our readers. If you prefer not to receive such mailings, please send an exact copy of your subscription label to: COMPUTE!'s GAZETTE, P.O. Box 10958, Des Moines, IA 50950. Include a note indicating your preference to receive only your subscription.

Authors of manuscripts warrant that all materials submitted to COMPUTE!'s GAZETTE are original materials with full ownership rights resident in said authors. By submitting articles to COMPUTE!'s GAZETTE, authors acknowledge that such materials, upon acceptance for publication, become the exclusive property of **COMPUTE!** Publications, Inc. No portion of this magazine may be reproduced in any form without written permission from the publisher. Entire contents copyright © 1987 **COMPUTE!** Publications, Inc. Rights to programs developed and submitted by authors are explained in our author contract. Unsolicited materials not accepted for publication will be returned if author provides a self-addressed, stamped envelope. Where programs are included in an article submission, a tape or disk must accompany the submission. Printed listings are optional, but helpful. Articles should be furnished as typed copy (upper and lowercase, please) with double spacing. Each article page should bear the title of the article, date, and name of the author. **COMPUTE!** Publications, Inc., assumes no liability for errors in articles or advertisements. Opinions expressed by authors are not necessarily those of **COMPUTE!** Publications, Inc. **COMPUTE!** Publications assumes no responsibility for damages, delays, or failure of shipment in connection with authors' offer to make tape or disk copies of programs published herein.

Commodore 64, Plus/4, 16, and 128 are trademarks of Commodore Business Machines, Inc., and/or Commodore Electronics Limited. Other than as an independent supplier of quality information and services to owners and users of Commodore products, **COMPUTE!** Publications, Inc., is in no way associated with Commodore Business Machines, Inc., or any of its subsidiaries.

Wizardry®



Now the world of Wizardry comes to Commodore 64/128

PROVING GROUNDS of the MAD OVERLORD

Also available for:
Apple II Series,
IBM PC & compatibles,
Tandy 1000 SX & EX,
Macintosh

With your Commodore 64 or 128 you can now experience an exciting initiation into the internationally-acclaimed world of the Wizardry Gaming System.

Begin with the first scenario*: Proving Grounds of the Mad Overlord. It challenges you to overcome devious tricks and sudden traps, strange and mysterious encounters, maze upon maze of puzzles, stimulating and intricate sub-plots and sophisticated themes. Ingenious multi-level, mind-bending tests abound with vile creatures, unspeakable villains, courageous adventurers and strong allies to hinder and help you achieve ultimate victory.

SIR-TECH

Sir-tech Software, Inc.,
P.O. Box 245, Ogdensburg, NY 13669
(315) 393-6633

® Registered trademark of Sir-tech Software, Inc.
© Copyright by Sir-tech Software, Inc.
Commodore is a registered trademark of Commodore International

PLAY IT TO THE HILT!

* Many other Wizardry scenarios coming for Commodore players.

Do you have a question or a problem? Have you discovered something that could help other Commodore users? We want to hear from you. Write to Gazette Feedback, COMPUTE!'s Gazette, P.O. Box 5406, Greensboro, NC 27403. We regret that, due to the volume of mail received, we cannot respond individually to programming questions.

The Way Scientists Count

I have a 64C computer and need to be able to make calculations such as 25 divided by 40,000, rounded off to .0006. However, when I do this, I get 6.25E−04. I thought the computer could go at least nine places to the right of the decimal point, but no matter what I try, I get this error message. Any ideas?

Rich Holzer

The letter E *in the answer doesn't mean* error. *The 64 automatically switches to scientific notation when numbers get too large or too small. The number 6.25E−04 is the 64's way of saying 6.25 times 10 to the negative 4th power, which is the same as 6.25 times .0001, or .000625. Your computer can handle up to nine digits of precision, of which only three are needed for the answer .000625.*

To see scientific notation in action, run the following program:

```
JB 10 A=1:B=1
RK 20 PRINT A,B
BA 30 A=A*10:B=B/10:GOTO20
```

Printers Have A Quote Mode, Too

For the past ten months, I have enjoyed using the *SpeedScript* word processor. However, since my purchase of version 3.1, I have noticed a bug in the program. I have waited until now in the hopes that the bug would be mentioned in the magazine. Unfortunately, it hasn't.

Whenever *SpeedScript* attempts to print a line to the printer or the screen which contains an odd number of quotation marks followed by embedded format commands, the format commands are not interpreted correctly. On the printout, reverse video characters appear. For example, if I try to underline a word inside quotation marks, the control codes for enabling underlining appear as reversed characters and the word is not underlined.

I believe that when *SpeedScript* encounters a single quotation mark while printing a document, the program thinks it's in the infamous quote mode.

Mark E. Chaloult

For readers who don't know about quote mode, here is a brief demonstration. First, type a few words and press SHIFT-CLR/HOME. The screen clears. Now type something and include a single quotation mark (SHIFT-2). When you press SHIFT-CLR/HOME, you'll see a reversed heart following the quotation mark. The screen doesn't clear because the computer is in quote mode.

Commodore printers (and printers that emulate Commodores) also have a quote mode. This is useful when you're printing out program listings that might contain various control characters.

The problem you're having is caused by quote mode, but it's not SpeedScript *that's in quote mode, it's your printer. Either your printer or interface is in Commodore emulation mode, and while that mode is in effect, an odd number of quotation marks will put you into quote mode. The only suggestion we can make is that you check the manuals for your printer and interface to see if Commodore emulation mode can be defeated by a direct command or by changing the DIP switch settings.*

How Big Is Too Big?

What is the maximum size, in blocks, of a program you will accept? The program I wish to submit will be at least 190 blocks once it is completed. Is this too long?

Calvin Tran

Yes. A program with a size of 190 blocks (nearly 50K) is far too long for us to publish. As a general rule, we try to limit BASIC programs to less than 8K (32 disk blocks). Machine language programs should be less than 4K (16 blocks). If the program is truly outstanding—the word processor SpeedScript *or the game "Crossroads," for example—the rule can be stretched (up to 60 blocks for BASIC, up to 30 blocks for ML).*

The main reason for limiting program size is that readers must be able to type in the programs in a reasonable time. The listing for your 190-block program would take up at least 12 magazine pages, which is a lot of typing. A second reason is that space for program listings is limited; a 12-page program would probably displace four or more other programs.

Extended Background Color Mode

In a past Feedback question, you mentioned an extended background color mode for the 64. Could you explain how to use extended background color mode, and how it differs from normal text mode?

Matt Sulser

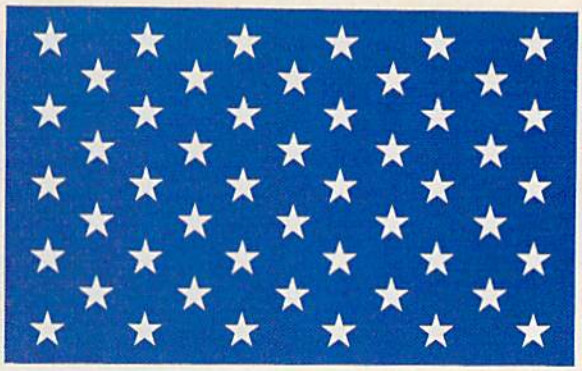
The 64 and the 128 in 40-column mode can display 256 characters on the text screen. The first 128 (numbered 0–127) include characters, punctuation, and graphics symbols. Characters 128–255 are the reversed images of the first half of the character set. To see the complete set of available characters, see the user's guide that came with your computer. Look in the appendix which lists screen codes.

On a normal text screen, only one background color is available. It's controlled by the register at location 53281. When you POKE 53281 with a number between 0 and 15, the entire screen changes color. Each character can have a different foreground color, but they all share a common background color.

The rules about color change when you enter extended background color mode. Instead of a single, global background color, you can choose from one of four available colors. Each character has a unique foreground color as well.

You pay a price for this added color capability. While extended background color mode is in effect, the number of available character shapes shrinks from 256 to 64. The number of background colors increases fourfold, but the number of characters is cut to a fourth. The 64 characters are 0–63 in the screen code table. If you'd prefer other characters, you'd have to create and install a custom character set (only the first 64 characters need be redefined).

Why 64 characters? Extended background color mode divides the character set into four separate groups, thus using up a total of 256 character definitions. The key to extended background mode is that each group of 64 characters has its own



WHY WAIT UNTIL NOV. 1988 TO FIND OUT WHO WILL WIN THE ELECTION WHEN YOU CAN FIND OUT RIGHT NOW?

Who's going to win the wide-open presidential race in 1988? Bush? Jesse Jackson? Albert Gore? Pat Robertson?

Don't wait for the pundits and pollsters to predict the outcome. You can do a better job with PRESIDENT ELECT,™ 1988 EDITION.

And you can do it right now.

This fun and fast game is a realistic simulation of the upcoming election. It's a perfect holiday gift for armchair politicians of all ages, from the seasoned campaign follower to the youngster just learning about America's democratic process.

Most current and potential candidates are included, all rated for their socio-economic views, foreign policy position, and charisma. You're free to change these ratings or to create your own candidates. By taking into account various economic factors and world events, you establish the political climate of the election.

Then you hit the campaign trail, managing and playing the candidate(s) of your choice. Your fixed allocation of Political Action Points must be spent wisely; campaign stops, carefully planned to avoid fatigue. If you choose to debate, you'll be scored on your answers to such hot issues as protectionism, Nicaragua, and arms control.

After nine turns (each being a week), the computer declares the winner.

The computer can also play a game over and over again – with major parameters changed each time – so you can quickly see how a particular election might turn out.

If you predict the correct winner with this game, you'll gain more than satisfaction. You'll have the chance to win up to $1988* in SSI's President Elect Contest starting now. The sooner you send in your prediction, the greater your chance to win the whole $1988.

Look for this political crystal ball at your local computer/software or game store today. *All SSI games carry a "14-day satisfaction or your money back" guarantee. Write or call for a free color catalog of our full line.*

APPLE®
C-64/128™
IBM® or Compatible
ATARI ST®

If there are no convenient stores near you, VISA and MC holders can order this $24.95 game by calling **toll-free 800-443-0100, x335.** Or mail your check to SSI. (CA residents, add applicable sales tax.) Please specify computer format and add $2.00 for shipping & handling.

STRATEGIC SIMULATIONS, INC.
1046 N. Rengstorff Avenue
Mountain View, CA 94043
(415) 964-1353

©1987 Strategic Simulations, Inc.

WIN UP TO $1988* if you predict the election outcome with PRESIDENT ELECT.

*See details in game box or contact SSI.

OMMODORE®
MODEM
300
AVE TIME AND MONEY.
et important information...FAST.
ecommunications may be your ticket to personal success!
Your Tele one Resource Center
For Your Commodore 128
64, SX-64, or VIC-20
commodore
modem/300
FOR YOUR COMMODORE 128 or 64
QuantumLink™ Software Disk
COMMODORE® PRESENTS
QuantumLink
The Online Service that's Easy-to-Use,
Inexpensive, Useful and Fun!
$500,000
TREASURE HUNT
Telecommunications Starter Kit
Includes
ONE MONTH FREE
$9.95 Value!
You get your second month free
when you pay for the first.
QuantumLink is owned and operated
by Quantum Computer Services, Inc.
Requires
Commodore 64™
or 128™
Disk Drive
Telephone Modem

Bring your COMMODORE® to life with a FREE modem and software!

Now you can plug your Commodore into an exclusive network that's useful, easy, fun and affordable. Join Q-Link now, and we'll give you a free modem and software to get you started.

Your official source of Commodore support.

Because Q-Link is offered exclusively to Commodore owners, you get the most relevant and useful services—including a hotline to Commodore Business Machines for fast answers to your questions. . . the GEOS Arena to help you get the most out of your GEOS software. . . "live" conferences with Berkeley Softworks and other software publishers such as Electronic Arts, Activision, to name a few. . . . and user group support.

You'll never be alone.

Meet and chat live with new friends from all over the U.S. and Canada. Participate in exciting full-color, multi-player games like RabbitJack's Casino (including Blackjack, Poker, Bingo and the Slots), Chess and Backgammon. Send and receive electronic mail. Join group discussions or start a special interest group of your own. Compete in contests and win prizes.

Save money every day.

Expand your software library with more than 10,000 free public domain programs — games, graphics, business and educational software, and much more! Sample "hot" software before you buy. Comparison shop for the lowest prices on more than 250,000 items. Get the lowest-priced airline tickets, rental cars and hotel rooms using American Airlines Eaasy Sabre SM Travel Service.

Offer valid while supplies last and only for new members in the continental U.S. and Canada. Expires 6/30/88. Prices subject to change. There is a communications surcharge for connection to Q-Link from Canada: 6 cents (U.S.) per minute from Montreal, Vancouver, Ottawa, Toronto, Quebec, Windsor, Kitchener, and Calgary using Tymnet network, and 15 cents (U.S.) per minute for over 85 other locations using the DATAPAC network.

Commodore is a registered trademark of Commodore Electronics, Ltd. Q-Link is a servicemark of Quantum Computer Services, Inc. Grolier's Academic American Encyclopedia is a trademark of Grolier Electronic Publishing. GEOS and Berkeley Softworks are tradenames of Berkeley Softworks.

The easiest online service to use.

When you join Q-Link, you'll receive customized software that does all the work for you. You don't have to memorize any complicated commands. To select what you want to do, simply choose from colorful, easy-to-use menus.

The lowest priced, full service Commodore network.

For only $9.95 a month, you'll enjoy unlimited access to a wide range of services — including the latest news, entertainment updates, Grolier's Academic American Encyclopedia, and help from experts at Commodore. Special "Plus" services, including online tutoring and software previews, cost only 8 cents per minute. And your first hour of Plus usage for each full month of membership is free!

With Q-Link, you can sharpen your computer skills...connect with people... discover new ways to get smart...save money every day...plus have a lot of fun!

For fastest service, call toll free 1-800-782-2278 Extension 1232 or clip and mail this coupon to Q-Link, 8619 Westwood Center Drive, Vienna, VA 22180.

Q-LINK RESERVATION FORM

Choose one:

☐ **I need a modem.** Start my Q-Link membership by charging me now for my first 4 months at $39.80, and send me the FREE Q-Link software and a FREE Commodore 300 baud auto-dial modem (model 1660—retail value $59.95).

☐ **I already have a modem.** Send me my FREE Q-Link software and start my Q-Link membership by charging me now for my first month of membership at $9.95.

Full Name _____

Address _____
(No P.O. Boxes)

City _____ State _____ Zip _____

Evening phone ( ) _____

Choose your method of payment:

☐ Please charge my credit card. ☐ Check enclosed.
☐ Master Card ☐ Visa

Acct# _____ Exp. _____

Signature _____

Call toll-free 1-800-782-2278 Ext. 1232 or mail this coupon to:
Q-Link, 8619 Westwood Center Drive, Vienna, VA 22180

Q-link SM

The Commodore® Connection.

background color register. Here's a list of the color registers along with their corresponding character sets:

Color Register	Screen Code	Character Set
53281	0–63	Normal characters
53282	64–127	Shifted characters
53283	128–191	Reversed normal characters
53284	192–256	Reversed shifted characters

It's easiest to think of characters in terms of their screen code instead of their ASCII value while you're using extended background color mode.

Bit six of the video register located at 53265 controls extended background color mode. When this bit is on (set to one), extended background color mode is enabled. Clearing this bit returns things to normal. To see extended background color mode in action, run the following program.

```
AC 10 POKE 53281,6:PRINT CHR$(
      147):POKE 53281,0:REM CL
      EAR SCREEN & SET TEXT CO
      LOR
QJ 20 REM SET COLOR REGISTERS
      {SPACE}TO BLACK, WHITE,
      {SPACE}CYAN, AND YELLOW
CG 30 POKE 53281,0:POKE 53282,
      1:POKE 53283,3:POKE 5328
      4,7
EQ 40 REM DISPLAY ALL FOUR CHA
      RACTER SETS
FA 50 FOR I=0 TO 63:POKE 1024+
      I,I:NEXT
EB 60 FOR I=64 TO 127:POKE 108
      0+I,I:NEXT
BB 70 FOR I=128 TO 191:POKE 11
      36+I,I:NEXT
GG 80 FOR I=192 TO 255:POKE 11
      92+I,I:NEXT
KF 90 PRINT:PRINT:PRINT:PRINT:
      PRINT:PRINT TAB(240)"PRE
      SS ANY KEY"
BG 100 GET K$:IF K$="" THEN 10
      0
BP 110 POKE 53265,PEEK(53265)
      {SPACE}OR 64:REM ENTER
      {SPACE}EXTENDED BACKGRO
      UND COLOR MODE
EB 120 PRINT CHR$(145)"THIS IS
       EXTENDED BACKGROUND CO
      LOR MODE"
HQ 130 GET K$:IF K$="" THEN 13
      0
BB 140 POKE 53265,PEEK(53265)
      {SPACE}AND 191:REM EXIT
       EXTENDED BACKGROUND CO
      LOR MODE
```

Function Keys F9 And F10

Did you know that you can redefine the HELP key on the 128? The program I've enclosed allows you to substitute any four letters for the word *HELP*, which prints when you press the HELP key.

Paul G. Hutchinson

The program you wrote POKEs into the area of memory where the function key definitions are stored, replacing the four characters that spell HELP *with four others. (Incidentally, the SHIFT-RUN/STOP key combination is treated as F9, and HELP is F10.) Here's a similar function key definition program that's not limited to four characters:*

```
CH 10 A$=CHR$(147)+"THIS IS TH
      E NEW HELP KEY"
RH 20 Y=LEN(A$):X=10:A=252:MEM
      =POINTER(A$)
CQ 30 BANK1:POKEA,PEEK(MEM+1):
      POKEA+1,PEEK(MEM+2):POKE
      A+2,1
PQ 40 BANK15:SYS65381,A,X,Y
```

Line 10 defines the string to be assigned to the HELP key and line 20 sets up several variables. To redefine SHIFT-RUN/STOP, change the value of X in line 20 from 10 to 9. You may also insert the values 1–8 for keys F1–F8, although for these keys it's easier just to use the KEY command. Line 30 sets up a zero-page pointer to the string, and line 40 calls the PFKEY Kernal routine that redefines function keys.

Controlling Sprites

I'm working on a video game for my 64 and I need help. What is the best way to make a sprite rebound from background characters (a wall, for instance)? Is there are way to detect a specific custom character that is involved in a collision with a sprite? I know how to PEEK

BetterWorking
From Spinnaker

Still waiting for the Disk Drive Light to go out?

This sophisticated Word Processor features a unique high speed disk operating system, a powerful spellchecker, and advanced features not found even in high priced word processors.

Unlike other word processors, WORDPRO WITH TURBO LOAD AND SAVE operates with lightning speed. There's no more endless waiting for the disk drive to load or save text. Because included in this package is the TURBO LOAD AND SAVE cartridge which, when used with the enclosed WordPro disk, speeds up the operation of your disk drive by 500%!

In addition, WORDPRO features full text editing and formatting functions such as search and replace, double columns, headers, footers, document chaining and personalized form letter mailings. WORDPRO lets you easily compose documents and check them for accuracy using the program's 100,000 word spellchecker. Plus, it supports over 100 printers with such features as preview, custom printer set-up and proportional spacing with right justification. It's a great word processor.

But especially it's super fast – how much is your time worth?

* WordPro With Turbo Load and Save is designed for the Commodore 64.

Available at fine software dealers or call:

1-800-826-0706

SPINNAKER

Spinnaker Software Corp., One Kendall Square, Cambridge, MA 02139

to detect collisions. Finally, could you write a machine language subroutine for a homing sprite? The homing sprite would chase after a player-controlled sprite. I'd like to be able to SYS to the routine from a BASIC program.

Keith R. Woodard

Try using four variables for each sprite—two to keep track of the current x- and y-position and two to keep track of the changes in the x- and y-positions. Say the variables are called PX, PY, CX, and CY. Within the main loop—where the program reads the joystick, checks the time, moves sprites, or whatever—you would do at least two things, update the PX and PY variables and move the sprite to the proper position on the screen.

At some point in the program, say the variables hold these numbers: PX=150, PY=162, CX=2, CY=-1. To update the position variables, PX = PX+CX and PY = PY+CY. The new values would be 152 for PX and 161 for PY. After changing the variables, store the new values from PX and PY into the sprite-position registers. Incidentally, since CX is positive, the sprite is moving to the right; and with CY being negative, the sprite is also moving up.

What happens when the sprite approaches a boundary? There are two ways to check for this condition. The first is to draw a border around the active screen area and read the collision register. When the sprite hits one of the border characters, you can make the sprite rebound. The second is to compare the PX or PY variable to the known edges of the screen. In sprite coordinates, the top line of the screen is 50. Thus, when the PY variable is 50 or less, you want the sprite to bounce back into the main screen. At this point, you should leave the values of PX and PY as they are. The change in X (variable CX) would also remain the same. But the sign of CY has to change. You'd use a line such as IF PY=<50 THEN CY=−CY. If CY had been −1, it would now be +1. If it had been +6, it would change to −6. The next time the sprite position is calculated, the new CY will move the sprite away from the border. The same idea would apply to checking the bottom, left, and right borders.

The next question is, how do you check which character was involved in a collision? There aren't any hardware registers you can PEEK to find the answer. Sprites are a minimum of three characters wide and nearly three characters high; if you expand the size of the sprite, it might cover a six-by-six area. It's possible that the sprite-to-character collision involves several different characters. If you keep track of the current position in PX and PY, there are a couple of ways you can decide which character was hit by a sprite. The first is to compare PX and PY to the known locations of various objects such as walls or treasure chests. The second is to calculate the screen position of the sprite and PEEK into screen memory to see which characters are in the vicinity.

Your third question asks for a routine to cause a computer-controlled sprite to chase a player-controlled sprite. There's no single technique for writing a pursuit routine. It depends on what kind of playing field you're using. If the screen is entirely open, the simplest way to give chase is to subtract the x- and y-position of the prey from the x- and y-position of the predator. You would again use the PX and PY variables. If the computer sprite is to the right of the player's sprite, the computer's PX would be a larger number and subtracting the player's x-position would give you a positive number. Likewise, if the computer's sprite is to the left, you'd get a negative number. The sign (plus or minus) can be extracted with the SGN function and then used to move the computer's player left or right. The same principle applies to the y-position.

If there are a few obstacles such as lakes or trees through which a sprite is not allowed to move, you'd have to adjust the routine slightly to allow dodging or movement around obstacles.

If the game is similar to Pacman, *the pursuit routine gets even more complicated. The chase sprite has to stay within the confines of the maze. It's not a good idea to use the collision register; most of the time*

BetterWorking
From Spinnaker

Welcome to the Future of Programming

The use of the C programming language is one of the most important developments in the micro-computer industry. C combines the productivity of high level languages with the control of low level machine languages. There are many reasons for using C: it executes ten times faster than BASIC, it's structured so that programs may be written more quickly, and programs written in C can be easily transported to other computers. For these reasons, C has rapidly become a major computer programming language and most serious micro-computer software development today is being performed in C.

POWER C is a true C language development environment with a full range of programming features. POWER C includes complete language components such as a C shell, a full screen syntax checking editor, a compiler and a linker. Plus two complete libraries including over 95 functions and C utilities. POWER C offers full support of floating point calculations and conforms to Kernighan and Ritchie standards. Two complete development environments are included – one for the C-64 and one for the C-128. POWER C's tutorial section will help get you started. Now you're on your way to faster and more effective programming.

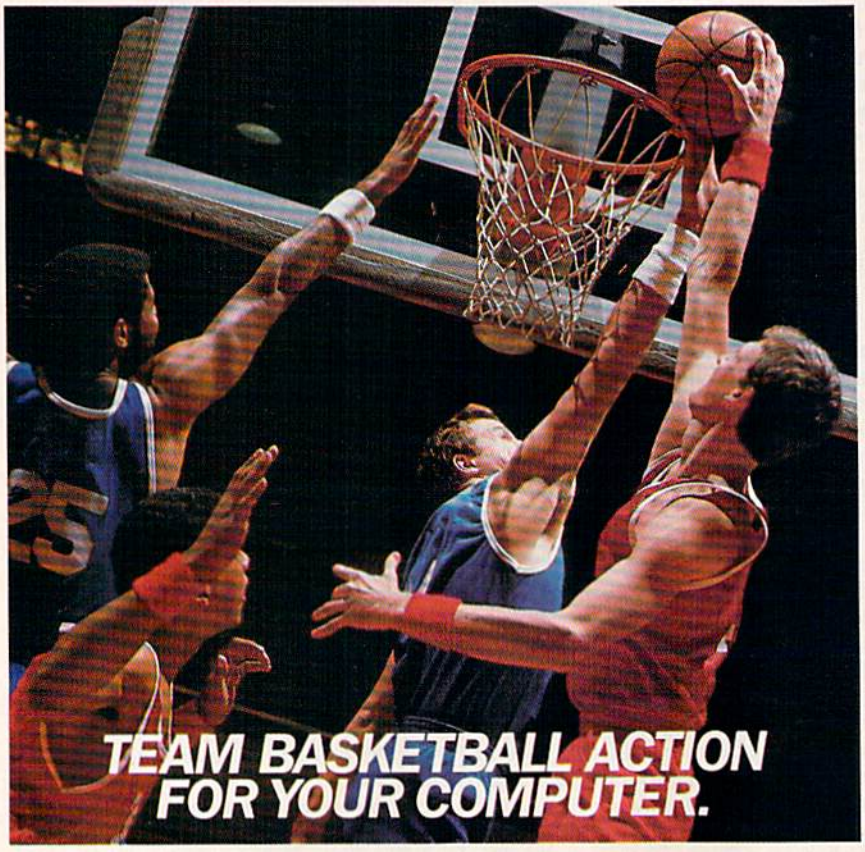
Power C is a true C Language compiler

SPINNAKER

Spinnaker Software Corp., One Kendall Square, Cambridge, MA 02139

Available at fine software dealers or call:

1-800-826-0706



Two-On-Two Basketball Action

One-on-one is OK for a little practice, but real basketball is a **team** sport. To be really good at it, you need **all** the skills – passing, dribbling, shooting, stealing and rebounding. That's what it takes to win a championship. That's what **GBA Championship Basketball™: Two-on-Two™** delivers.

From the roar of the crowd to the swish of the net, from slam dunks to three-point shots, it's all here – fast and competitive.

Not only is there **team** action, but you can even compete in a 4-division, 23-team league – all the way to the playoffs and the GBA Championship game!

When you're ready to jump into the big leagues of computer basketball, start with the game that begins where the others leave off – **GBA Championship Basketball: Two-on-Two.**

For Commodore 64, 128 and Amiga, Apple IIe, IIc, and IIGS, Atari ST, IBM PC, PCjr, Tandy 1000 and 100% compatibles.

Apple IIGS screen shown.

GAMESTAR

To order, visit your local retailer or call 1-800-227-6900. Commodore 64, 128 and Amiga are trademarks of Commodore Electronics, Limited. Apple is a trademark of Apple Computer, Inc. Atari ST is a trademark of Atari Corporation. IBM PC and PCjr are trademarks of International Business Machines Corporation. Tandy is a trademark of Tandy Corporation.

Look for specially marked GAMESTAR packages featuring an exclusive offer from Sports Illustrated.

a collision is imminent. You'd probably want to put all of the corners into an array and check the x- and y-position of the sprite to see if it's in a corner. If so, you'd turn the corner and continue in a straight line. When the pursuing sprite reaches an intersection, it would have to make the decision of which fork in the road provides the fastest route to reach the player. The form the program took would depend entirely on the size and shape of the maze.

In The Numbers

What is the difference between the 6502 and the 6510 microprocessor chips?

Matt Morgan

The 6502 processor family is a large one. Many computers (including all the eight-bit computers from Apple, Atari, and Commodore) use the 6502 or a variation of it. The 6510 processor found in the Commodore 64 acts just like a 6502, except for one thing: A few input/output circuits were added to the chip to make memory locations 0 and 1 control data ports and bank selection. In all other respects, programming the 6510 is the same as programming the 6502.

Two newer members of the 6502 family, the 65C02 and the 65816, are upwards-compatible with the 6502. This means that they run programs written for the 6502, plus they add additional instructions to allow shortcuts and new addressing modes. Because of the differences between the 6502 and the 6510, you cannot unplug your 6510 and replace it with one of these newer chips.

Click And Gone

I have recently purchased a modem and would like to know if the call-waiting signal on the telephone would have any effect when I am online with my computer.

Shaun Conrardy

The telephone company's call-waiting option generates an audible click when you're on the telephone and a second call comes in. If you happen to be using a modem, the click will usually knock you offline. This can lead to unhappy results, especially if you've just spent 30 minutes downloading a file and were almost finished receiving it.

*In some telephone exchanges, you can disable call waiting—for a single call only—by pressing *70 on your touchtone telephone before dialing the number. To see if this works in your area, ask your local phone company or test it out by having two friends call while you have call waiting turned off.*

Make Any Computer Do Exactly What You Want With McGraw-Hill's

Contemporary Programming & Software Design Series

Make no mistake. Almost all books and courses on "programming" teach you only the final 5% of the total programming process—namely, how to code in a specific language . . . information of little value if you don't know how to reach the point in the programming process when you are ready to code.

With the Series, however, you'll learn to create your own programs from scratch, even modify off-the-shelf programs. You'll learn enough BASIC and machine language to get you started on the remaining 5% of the programming process.

From Writing Your Own Programs to Modifying Existing Software, Here's the New, Easy, and Low Cost Way to Unlock the Secrets of Your Computer

Whether you use computers for business, for personal applications, or for fun, off-the-shelf programs will never do everything you want them to do for you. That's because they were written by programmers to satisfy what they perceived as the needs of the greatest number of potential users—often missing some or many of your specific needs.

That's why McGraw-Hill's new Contemporary Programming and Software Design Series teaches you how to create your own software . . . either from scratch or by making key modifications to existing programs.

There is nothing magical about it. You learn the process of building a computer program step-by-step with McGraw-Hill *Concept Modules* sent to you one at a time, once a month. Each of the ten modules in the Series takes you through an important step in the development of the structure and detailed logic of a program, including testing, debugging, and documentation.

Unique Interactive Hands-On Instruction

Each module includes an easy-to-understand guide PLUS a 5¼" floppy disk containing typical programs and interactive instruction that you can run on Commodore 64 and 128 computers, IBM PCs and PC compatibles for hands-on experience.

In the first Module, for example, when your sample program (Declining Interest Loans) appears on your screen, you'll find errors on certain program lines. You'll also see that the program is only three-quarters completed.

Now comes the fun part. You'll discover how this program is built, and in the process you'll learn how to identify and correct errors. And by the end of Module 1, you'll actually have completed this program yourself.

But there's more. Special graphics on your screen work in conjunction with the accompanying guide to amplify, illustrate, and deepen your understanding of software design principles.

Build Your Own Personal Software Library

The sample programs you work with throughout the Series are excellent learning tools. But they're more than that. By combining the sample programs onto one master disk, you'll have the start of your own personal software library. In addition to the programs you've written and modified throughout the Series, you'll also receive dozens of the most popular public domain and user-supported programs, such as data base manager, word processor, calendar generator, appointments reminder and much, much more.

15-Day No-Risk Trial

To order your first module without risk, send the postage-paid card today. Examine the first module for 15 days and see how the Series will help you make your computer do exactly what you want it to do!

If someone has beaten you to the card, write to us for ordering information about the Contemporary Programming and Software Design Series.

The Crucial 95%—Learn the Foundation of Computer Programming

While the Series includes interactive disks that run on specific computers, everything you learn you can apply to any language or machine. Why is this possible? Because McGraw-Hill knows programming is far more than coding a program into the computer using a specific language. In the real world of computers, 95% of the programming process is carried out using design techniques that are independent of specific language or machine. It is this crucial 95% that you thoroughly understand and master in the Series.

McGraw-Hill Continuing Education Center
3939 Wisconsin Avenue
Washington, DC 20016

Best Sellers!

The Commodore Games That Live On And On

Keith Ferrell, Features Editor

Some games take on a life of their on, outperforming even their creator's high expectations. What makes a best seller? GAZETTE talked to several leading software publishers and found out which games were their Commodore best sellers—and why.

We all have our favorite software games and entertainment packages, and sometimes our views are shared by tens of thousands of others, creating a best seller.

We asked the major publishers of Commodore entertainment software what made their popular games special. Their answers were informative and surprising.

Here are the top three best-selling Commodore games from 13 of the leading software publishers:

Access

1. Beach-Head A combat simulation that places the player in confrontation against naval, air, and land forces, *Beach-Head* was one of the first arcade war games to offer realistic graphics, according to Kevin Jones of Access. The game's realism has helped make it an ongoing best seller. A sequel, *Beach-Head II*, was also popular.

Beach-Head

2. Raid over Moscow Challenging players to master many arcade scenarios as they penetrate Soviet security, this game's playability and strong graphics have made it perennially popular with Commodore owners. *Raid over Moscow* is now packaged with *Beach-Head* and *Beach-Head II* in a value pack that continues to enjoy strong sales.

3. Leaderboard Appealing to legions of golf fans, *Leaderboard* offers players the same perspective enjoyed by actual golfers. The game tracks the ball in a manner similar to a golfer's view of the real thing.

Accolade

1. Hardball! The great American pastime also makes for great software, says Peter Doctorow, Accolade's vice president for product development. *Hardball!* has been such a success, he says, because Accolade's goal was to recreate the *feeling* of baseball. He graciously acknowledges that some of the credit for the software's success belongs to Abner Doubleday, the inventor of baseball.

Hardball!

2. Ace of Aces This game combines flight simulation, strategy, historical recreation, and the difficulties of accomplishing a mission. The combination of elements, along with the sense of reward that accompanies the successful completion of a mission, makes *Ace of Aces* a consistent seller.

3. Fight Night Accolade's third best-selling program is set in the world of boxing. In *Fight Night*, the user has unique control over the characters, a feature that's helped achieve the game's success.

Activision

1. Ghostbusters The success of the Bill Murray/Dan Aykroyd film played a large part in making *Ghostbusters* a success with Commodore users, says Melinda Mongelluzo, public relations coordinator for Activision. Mongelluzo believes the game's combination of comedy and arcade action contribute greatly to *Ghostbuster*'s continued sales.

2. GBA Basketball Championship: Two on Two *GBA Basketball* struck a responsive chord with Commodore owners who enjoy graphic sports games.

GBA Basketball Championship

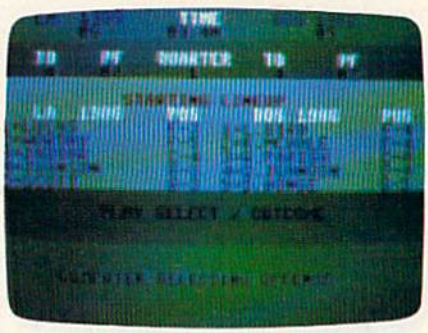
3. Hacker A consistent seller since its release in mid-1985, *Hacker* has sold more than 50,000 copies. Commodore owners enjoy the program's challenge, which is nothing less than using their skills and instincts to find the way through a computer system.

Avalon Hill

1. Super Sunday This is Avalon Hill's top-selling computer game, according to Phyllis Opolko, spokesperson for the company. Opolko attributes the game's ongoing success to the accuracy of the statistical game, as well as the graphics the program offers.

2. Spitfire '40 *Spitfire '40* found a warm response among flight simulator fans. The program simulates the classic World War II British fighter planes.

3. NBA This program became an immediate best seller for Avalon Hill upon its release last spring. As with *Super Sunday*, an accurate statistical game matched by solid graphics is considered to be the key to *NBA*'s popularity.



NBA

Brøderbund

1. Karateka A fast-action martial arts game, *Karateka* has kicked and chopped its way to the top of Brøderbund's all-time best seller list. Ulla Thomsen, a public relations spokesperson for the company, observes that *Karateka*'s ongoing sales success, since its mid-1985 release, is a function of the tightness of the game's programming, its graphics, and the public's fascination with karate.

Karateka

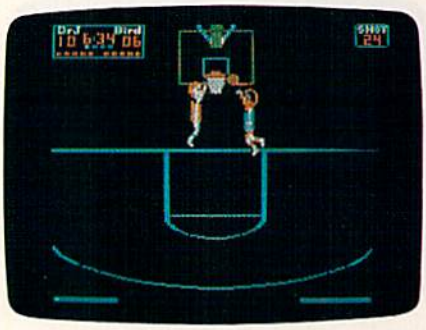
2. Lode Runner This action/strategy game offers players the chance to create their own mazes and walls. Thomsen believes that this never-ending supply of challenging screens has helped *Lode Runner* remain a top seller for more than four years.

3. Where in the World Is Carmen San Diego? *Carmen San Diego*'s ability to appeal to players of all ages has made it a Brøderbund best seller. The game appeals to users of all interests, and is educational for both children and adults.

Electronic Arts

1. Skyfox *Skyfox*'s state-of-the-art futuristic combat simulation has found an enthusiastic market, says Charlotte Taylor of Electronic Arts. The game challenges players to defend an asteroid base against hordes of alien invaders.

2. Dr. J and Larry Bird Go One on One This was one of the first sports simulations to incorporate the skills and idiosyncracies of actual players. The participation of Julius Erving and Larry Bird played a large part in establishing the game as one of the company's consistent best sellers. Taylor points out that when all computer systems are lumped together, *One on One* is Electronic Arts's all-time, number-one-selling program.



One on One

3. Racing Destruction Set One key to *Racing*'s strong sales is that users can create their own features, such as automobiles and race tracks. Taylor says that Commodore owners tend to prefer arcade-type games that combine action with creativity.

Epyx

1. Winter Games *Winter Games* is one of the most popular of Epyx's *Games* series, according to Noreen Lovoi, manager of the company's public relations. As in all Epyx products, Lovoi continues, the emphasis on graphics and playability finds a ready market among Commodore owners. Another factor in its success, she adds, is *Winter Games*' offering of several different events within one package.

Winter Games

2. Summer Games II Having reached the market in May 1985, shortly before the actual summer games were held in Los Angeles, *Summer Games II* is a strong second-place best seller for Epyx. Again, graphics, ease of play, and variety of activity have helped make *Summer Games* an entertainment package for all seasons.

3. Temple of Apshai The first Epyx product—actually released in 1979 by Automated Simulations, Epyx's predecessor—*Temple of Apshai* is a high-fantasy game. The timeless quality of such games has helped *Temple* continue to sell. In its current incarnation, the game is marketed as the *Temple of Apshai Trilogy*—the original game bundled with its two sequels.

Firebird

1. Elite Combining space commerce and trading with a complex interstellar culture and lots of arcade action, *Elite* is Firebird's number-one Commodore program, according to Tom Benford, who handles the company's public relations. The fact that *Elite* allows players to build careers and accumulate wealth over long periods of time is appreciated by those who like games that operate on several levels and require more than a few minutes to play.

Elite

2. The Pawn An illustrated text adventure, *The Pawn* has attracted Commodore owners with its fantasy story and high-quality graphics. Equally important is the game's sophisticated parser and the unexpected humor of some of its situations and language.

3. Starglider Number three on Firebird's list is its 3-D space combat game, *Starglider*. The variety of perspectives on the action, as well as the realtime nature of *Starglider*'s combat have helped make the game a big seller.

Infocom

1. Zork Trilogy Originally designed on a mainframe more than a decade ago, *Zork* was divided into three parts for microcomputer gamers; the first part was released in 1980. The game, according to Cynthia Weiss of Infocom, pioneered the form of interactive text adventures. With nearly a million copies sold in all formats, the *Zork Trilogy* is one of the most successful computer games ever published.

2. The Hitchhiker's Guide to the Galaxy Based on Douglas Adams' highly successful novel, and assembled with the assistance of Adams, this release appealed to fans of whimsical science-fiction adventure as well as admirers of Adams' work. The nature of the original novel helped insure a successful translation of it into interactive form.

3. Leather Goddesses of Phobos This game parodies the science fiction of the 1930s. *Leather Goddesses* is essentially humorous, focusing on the more exaggerated elements of early science fiction. It contains a pronounced ribald element as well. Another appeal is that the game allows players to select the genders of their characters.

RUNAWAY BESTSELLER!

A greeting card in 5 minutes? Easy.

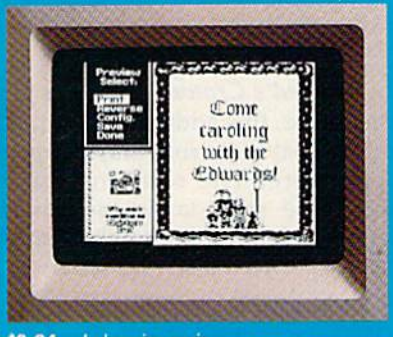
10:00 — *Pick from 11 beautiful borders.*

10:01 — *Select from more than a hundred high-quality graphics — hundreds more when you add the Art Galleries.*

10:02 — *Preview and make changes anytime without starting over. What a time saver!*

Enter Text
Arrows = move Esc = quit
Why work overtime on Christmas Eve?
To change options press:
Ctrl-A. Alignment = Centered
Ctrl-S. Text Size = Normal
Ctrl-T. Texture = Standard
Ctrl-F. Text Font = Office

10:03 — *Craft your message from 9 expressive typefaces in upper and lower case.*



10:04 — *And preview again.*

TAH-DAH!

PrintMaster Plus™

Easily the best.

PrintMaster Plus does calendars, too.

Truly original calendars, cards, posters, banners and stationery are so much easier with PrintMaster Plus. In fact, the process you see here is impossible with other specialty printing programs. And PrintMaster Plus gives you terrific artwork — not outline art but highly detailed, one-of-a-kind graphics with a difference.

Accept no substitutes. Ask your dealer for PrintMaster Plus and the Art Galleries today. Or use the convenient order form. For more information, call Unison World at 415-848-6666.

Unison World

PrintMaster Plus, Art Gallery I, II, III, and Unison World are trademarks of Kyocera Unison, Inc. Commodore is a registered trademark of Commodore Electronics Limited. Copyright 1987, Kyocera Unison, Inc.

Clip and mail to Unison World, Box 3056, Berkeley, California, 94703

YES! Send me the best. Please rush me the following:

____ PrintMaster Plus for Commodore 64/128	$34.95
____ Art Gallery I — 140 extra general theme graphics	$24.95
____ Art Gallery II — 140 extra general theme graphics	$24.95
____ Art Gallery III — 140 fantasy theme graphics NEW	$24.95
Subtotal	_____
CA residents add 7% sales tax	_____
Total	_____

____ Check ____ Money Order ____ Visa/MasterCard

CARD NO _____ EXP DATE _____

SIGNATURE _____

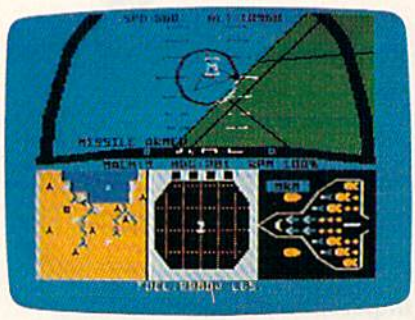
NAME (PLEASE PRINT) _____

STREET ADDRESS _____ APT _____

CITY _____ STATE _____ ZIP _____

Microprose

1. F-15 Strike Eagle Three years after its release, this combat flight simulator remains on the charts. Michael Harrison of Microprose attributes its initial success to the fact that it was ahead of its time when first released. *F-15*'s ongoing sales have occurred because the game lets players take the controls of a jet fighter—and experience something they couldn't do without a computer.



F-15 Strike Eagle

2. Silent Service This simulation of a World War II submarine command offers an accurate recreation of history, and that accounts for a big part in the game's success; for example, the technological capabilities of the sub increase as the war progresses, just as technology improved during the actual war.

3. Gunship Among the most high-tech simulations available, *Gunship* puts players at the controls of a highly armed helicopter. Another factor in its large sales is the inclusion on the disk of both past and present "hot spots"—mission scenarios that reflect current headlines.

Mindscape

1. Bop-n-Wrestle Karen Novak of Mindscape says there's a simple explanation for *Bop-n-Wrestle*'s success: The game offers good entertainment. What people want most out of computer games, she adds, is fun.

2. Infiltrator This flight simulator includes characters and a story line. According to Novak, the added richness of the game has attracted buyers in large numbers.

3. Superstar Ice Hockey A 1987 release, *Superstar Ice Hockey* moved immediately onto Mindscape's all-time best-seller list. Its success is a function of its breadth of approach: The game engages players on strategic as well as arcade levels, allowing them to manage and coach, as well as play.

Superstar Ice Hockey

subLogic

1. Flight Simulator Since its 1984 release, says subLogic spokesman Norm Olson, this program has remained popular because of its appeal to a common desire: People want to know how to fly an airplane. The company's goal was to create a simulation that provided 90 percent of the experience of flying, with none of the cost of lessons and aircraft rental.

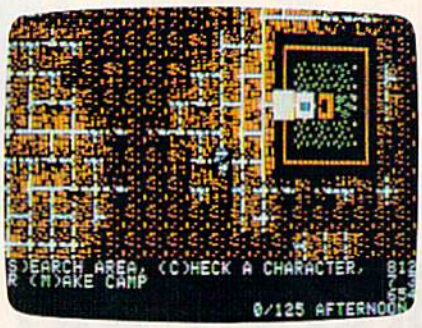
Flight Simulator

2. Jet Another flight simulator, *Jet* adds supersonic speeds as well as a military element. The program allows players to select weaponry and engage in combat in either an F-16 or an F-18 fighter.

3. Night Mission Pinball The appeal of this game stems from its variety of challenges. It offers more than 40 different user-adjustable parameters through which players can tailor the game to their own tastes.

SSI (Strategic Simulations, Inc.)

1. Phantasie *Phantasie* was one of the original fantasy role-playing games, notes Linda Blanchard of SSI. The game found an enthusiastic response among Commodore owners who enjoy assuming the parts of characters on heroic quests in mystical lands inhabited by creatures such as elves and gnomes.



Wizard's Crown

2. Wizard's Crown Another fantasy game, this adds a level of tactical combat to its role-playing quest adventure. The combination of war-game style tactics and high-fantasy adventure has helped make *Wizard's Crown* a strong seller.

3. War Game Construction Set The success of this 1987 release is a result of its originality. The game allows users to create any type of battle simulation, from actual historical encounters to wholly imaginary conflicts. *War Game Construction Set* can be enjoyed by players of any skill level. ©

Skarlen

Over thirty separate buildings you can enter, many have more than one floor.

NEW!

We at Balistic Software have created an adventure game that bridges the gap between computer and player. We have combined exciting angular graphics, battle screens fast enough to make you sweat, and innovative menu driven play which provides a totally new game experience.

How to order:

Visit your Retailer or call

1-800-255-6910

in Ohio call **1-800-255-6905**

Please have your Visa or Mastercard number ready. To order by mail, send $29.95 plus $3.00 shipping and handling in check or money order to:

Balistic Software
2086 Klondike Rd.
Delaware, OH 43015

There is a 10 day check clearing policy.

For Commodore 64/128

Battles are in real-time, which is extremely rare, and a lot of fun.

Incredibly detailed map graphics with separate terrain sounds and moving water.

Tal'pao, one of the many cities you will find during your quest.

GAZETTE Readership Survey

What do you like most about COMPUTE!'s Gazette? And what don't you like? We want GAZETTE to be as useful and interesting as possible, and to provide you with the coverage you want most.

Please take a moment to fill out and mail us this questionnaire (photocopies are fine). Some questions may require more than one answer.

Mail questionnaires to *GAZETTE Readership Survey, P.O. Box 5406, Greensboro, NC 27403.*

What Commodore computer(s) do you own or use?

☐ 128
☐ 64
☐ Plus/4
☐ 16

Do you own or use a computer not listed above?

☐ Yes (please specify) _____

_____

_____

☐ No

Do you plan to purchase another computer within the next year?

☐ Yes
☐ No
☐ Undecided

If you answered yes to the above question, which computer do you plan to buy? _____

Do you use *GEOS*?

☐ Yes
☐ No

Are you a member of a Commodore user group?

☐ Yes
☐ No

Which of the following peripherals do you own or use with your computer?

☐ Dot-matrix printer
☐ Letter-quality printer
☐ Modem
☐ Memory expansion

What types of software have you purchased in the past year?

☐ Word processor
☐ Programming language
☐ Graphics design
☐ Telecommunications
☐ Education
☐ Games
☐ Business applications
☐ Other
☐ None

Which language do you prefer for programming?

☐ BASIC
☐ Machine language
☐ Other
☐ I don't program my computer

Which part of the magazine do you like most? (Check no more than two.)

☐ Features
☐ Reviews
☐ Education/Home Applications
☐ Programming
☐ Departments
☐ Advertisements

Which columns do you read regularly?

☐ Gazette Feedback
☐ Simple Answers to Common Questions
☐ Computing for Families
☐ Horizons
☐ The *GEOS* Column
☐ BASIC for Beginners
☐ Machine Language for Beginners
☐ Hints & Tips

What topic(s) would you like to see covered regularly in a column?

_____

_____

_____

Do you use programs published in GAZETTE?

☐ Yes
☐ No

If so, how do you obtain copies?

☐ Type them in
☐ GAZETTE Disk
☐ Other (please specify) _____

_____

_____

Additional comments:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

©

SAVE A BUNDLE ON A BUNDLE!

C= COMMODORE AMIGA 500 $CALL

512K RAM Upgrade.....$159.00
1010 EXTERNAL DRIVE $219.00
1680 MODEM.....$139.00

A500 w/2002 Monitor.....$789.00
A500 w/2002 Monitor & 1010 Drive...$999.00

C= COMMODORE PC COMPATIBLES

$499

PC 10-1 PACKAGES

PC-10/1 without monitor $499.00
PC-10/1 with 1901 mono monitor.....$579.00
PC-10/1 with 2002 color monitor.....$749.00
OPTIONS: Installed and tested at no extra charge.
Additional 128K RAM $39.00
20 megabyte Seagate Hard Drive with controller $289.00
30 megabyte Seagate Hard Drive with controller $349.00

PC 10-2 PACKAGES

PC-10/2 without monitor $599.00
PC-10/2 with monochrome monitor (model #1901) $679.00
PC-10/2 with color monitor (model #2002) $849.00

FSD-2 DISK DRIVE
1541C Compatible
$149

C= COMMODORE 1764
256K RAM EXPANSION
$119

C= COMMODORE 1581
3½" DISK DRIVE
$197

5 Free Games!

Buy a Commodore 64™ and get over $100 of outrageous Epyx® software —Absolutely Free!

Winter Games™
Summer Games™
Jumpman Junior™
Super Cycle™
Pitstop II™

Offer Good 10/15/87 Thru 1/1/88 CALL FOR DETAILS!

C= COMMODORE 64C

$159.95

1541C DISK DRIVE $169.95
1802C MONITOR $189.00

64C w/1541C Drive.....$328.00
64C w/FSD-2 Drive.....$299.00
1802C with either package.....$184.00

C= COMMODORE 128

$219

1571 DISK DRIVE $229.00
2002 MONITOR $269.00

C128 w/1571 Drive.....$444.00
C128 w/1571 & 2002 Monitor.....$699.00
C128 w/1571 & Thomson 4120.....$659.00

PRINTER PACKAGES

ALL PRINTERS INTERFACE WITH C-64 or C128

star

NP-10 & XETEC Supergraphix Jr.....$169.00
NX-10 & XETEC Supergraphix Jr.....$189.00
NX-10 & XETEC Supergraphix.....$199.00

Panasonic

1080i & XETEC Supergraphix Jr.....$189.00
1080i & XETEC Supergraphix.....$199.00
1091i & XETEC Supergraphix.....$219.00

tcp

CALL TOLL FREE **1-800-468-9044** Inside PA Call 814-234-2236

TUSSEY COMPUTER PRODUCTS P.O. BOX 1006 STATE COLLEGE, PA 16804

DON'T SETTLE FOR LESS...tcp

COMMODORE 128

New, Factory Sealed Units

$219.00

1571 Disk Drive.....$229.00
2002 .....$269.00

COMMODORE 64C

$159.95

Includes GEOS and Quantum Link
1541C Disk Drive.....$169.95
1802C Monitor.....$189.00

NEW!! COMMODORE 128D

$439.00

- 128K Memory
- Built in 1571 Disk Drive
- Detachable Keyboard

GAME GALLERY

Educational Software too!
All Games stocked for quick ship!!!

ACCESS
* Echelon	$34.95
Leader Board	$29.95
Leader Board Tourn. Disk	$16.95

ACCOLADE
Ace of Aces	$23.95
* Comix	$24.95
Hard Ball	$22.95
Killed Until Dead	$CALL
* Miniput	$24.95

ACTIONSOFT
Up Periscope	$24.95
Thunder Chopper	$24.95

ACTIVISION
* Aliens	$24.95
* Championship Baseball	$27.95
* Championship Football	$27.95
Gamemaker Scifi Library	$15.95
Gamemaker Sports Lib	$15.95
Garry Kitchen's Gm'makr	$24.95
GBA Basketball 2 on 2	$24.95
* Gamemaker Package with all Librarys	$39.95
I am the 64	$21.95
I am the 128	$24.95
Little Computer People	$24.95
* Maniac Mansion	$29.95
* Music Studio	$27.95
Shanghai	$26.95
* Top Fuel Eliminator	$19.95
* Transformers	$22.95

BRODERBUND
Lode Runner	$24.95

DATA EAST
Commando	$24.95
Karate Champ	$26.95

DATASOFT
* Alternate Reality: The Dungeon	$24.95
* Bismark	$24.95
* Dark Lord	$19.95
* Force 7	$19.95
* Tobruk	$27.95
* Tomahawk	$24.95

★ NEW TITLES!

ELECTRONIC ARTS™
* Amnesia	$27.95
Arctic Fox	$24.95
Autoduel	$37.95
Bard's Tale	$32.95
Bard's Tale II	$29.95
Bard's Tale Clue Book	$10.95
Battlefront	$29.95
Carriers at War	$37.95
Chessmaster 2000	$26.95
Dan Dare	$16.95
* Dungeon Runners	$19.95
* EOS(Earth Orbit Station)	$19.95
Europe Ablaze	$37.95
* Instant Music	$24.95
* Legacy of the Ancients	$19.95
Marble Madness	$23.95
Moebius	$29.95
Murder Party	$25.95
Music Construction Set	$12.95
* Patton vs Rommel	$29.95
PHM Pegasus	$27.95
Pinball Construction Set	$12.95
* Skate or Die	$24.95
Seven Cities of Gold	$12.95
Starfleet I	$32.95
* Strike Fleet	$29.95
Touchdown Football	$22.95
Ultima I	$29.95
Ultima III	$37.95
Ultima IV	$45.95
World Tour Golf	$27.95
* Yeager AFT	$24.95

EPYX
500 XJ Joystick	$14.95
* California Games	$29.95
Championship Wrestling	$27.95
Create a Calender	$CALL
Movie Monster	$16.95
* Street Sports Baseball	$29.95
* Street Sports Basketball	$29.95
Sub Battle	$29.95
Summer Games	$16.95
Summer Games II	$26.95
Super Cycle	$16.95
Winter Games	$27.95
World Games	$29.95
World's Greatest Baseball	$24.95
World's Greatest Football	$28.95

FIREBIRD
Elite	$22.95
* Guild of Thieves	$29.95

INFOCOM
Hitchhiker's Guide	$22.95
Leather Goddess	$24.95
Wishbringer	$25.95
INVISICLUE BOOKS FOR ANY INFOCOM GAME	**$6.95**

LANCE HAFNER for the best in sports strategy simulation
3 in 1 Football $29.95
Basketball, the Pro Game.. $29.95
Final Four Basketball $29.95
Coming Soon ... Baseball !!!

MICROPROSE
Acrojet	$24.95
* Airborne Rangers	$CALL
F-15 Strike Eagle	$21.95
Gunship	$24.95
Kennedy Approach	$24.95
NATO Commander	$24.95
Pirates	$25.95
Silent Service	$24.95
Solo Flight	$24.95
* Stealth Fighter	$CALL

MINDSCAPE
* Defender of the Crown	$29.95
Fist	$19.95
* Gauntlet	$29.95
Indiana Jones	$22.95
* Indoor Sports	$24.95
Infiltrator	$21.95
* Paperboy	$29.95
Parallax	$19.95
Perfect Score:SAT prep	$49.95
Uchi Mata	$19.95
Uridium	$26.95
Call for prices on other MINDSCAPE products!	

MISC GAMES
Championship Boxing	$17.95
Hobbitt	$24.95
International Hockey	$18.95

SIMON & SHUSTER
Paper Airplane const.	$24.95
Star Trek-Kobayashi Alt.	$29.95
Star Trek Promethian Adv	$29.95
Typing Tutor III	$29.95

SSI
* Shard of Spring	$29.95
* Eternal Dagger	$27.95
* Fantasy I, II, III (each)	$27.95
* Rings of Zilfin	$29.95
* Wizards Crown	$27.95

SUBLOGIC
Flight Simulator II	$32.95
Football	$37.95
FS II Scenery disks	$CALL
Jet	$29.95
Pure Stat Baseball	$37.95

WEEKLY READER
Call for all your Favorite Sticky Bear Titles !!

COMMODORE 128 SOFTWARE

WORDPROCESSOR
FLEET SYSTEM 4	$56.95
Font Master 128	$44.95
JANE	$32.95
PAPERCLIP II	$54.95
PAPERCLIP III	$CALL
SUPERSCRIPT 128	$59.95
TERM PAPER WRITER	$34.95
VIZAWRITE 128	$CALL
WORDPRO 128	$59.95
W'D WRITER 128 w/spell	$49.95

SPREADSHEETS
EPYX MULTIPLAN	$39.95
SWIFTCALC 128 w/sideways	$49.95

DATA BASES
CONSULTANT	$39.95
DATA MANAGER 128	$CALL
FLEET FILER	$29.95
PERFECT FILER	$49.95
PROFILE 128	$59.95
SUPERBASE 128	$64.95

MISC. 128 SOFTWARE
ACCOUNTANT INC	$69.95
DESK MANAGER 128	$34.95
VIZASTAR 128	$CALL
MACH 128	$39.95
PARTNER 128	$54.95
PERSONAL ACCT. 128	$34.95
SYLVIA PORTER'S personal finance planner	$54.95

C-64 BUSINESS AND PRODUCTIVITY

64C DATABASES
Bank Street Filer	$34.95
Consultant	$39.95
Data Manager	$19.95
Fleet Filer	$29.95
Profile 64	$36.95

64C INTEGRATED PKGS
Homepak	$39.95
Vizastar 64 4K	$39.95

64C SPREADSHEETS
Calkit	$39.95
Swiftcalc 64 w/sideways	$39.95
Sideways	$19.95

64C WORD PROCESSORS
Bank Street Writer	$32.95
Font Master II	$34.95
Font Master 64	$34.95
Paperclip w/spellpack	$49.95
Paperclip III	$CALL
Pocket Writer Dictionary	$19.95
Wordpro 3+/64	$14.95
Word Writer 64 w/speller	$34.95

FINANCIAL & ACCT.
Timeworks Electr. Chkbk.	$19.95
Timeworks Money Mgr	$19.95

MISC. HARDWARE
Estes pwr supply for C-64	$54.95
Naverone 3 Slot expander	$27.95

UTILITIES
Thinking Cap	$32.95
Toy Shop	$42.95
Copy II 64/128	$24.00
CSM 1541 align	$34.95
Fast Load	$24.95
Merlin 64	$34.95

GRAPHICS CORNER
Graphics Scrapbk 1 or 2	$17.95
Newsroom	$34.95
Picasso's Revenge w/pen	$42.95
Certificate Maker	$32.95
Certificate Library	$24.95
Clip Art Vol 1	$19.95
Clip Art Vol 2	$24.95
GEO Publish	$CALL
Graphics Library I,II,or III	$16.95
Print Shop	$25.95
Print Shop Companion	$22.95

tcp TUSSEY COMPUTER PRODUCTS

P.O.BOX 1006, STATE COLLEGE, PA 16804

IS HASSLE-FREE MAIL ORDER

AMIGA Software

PRODUCTIVITY

Deluxe Music Const Set	$69.95
Deluxe Paint II	$89.95
Deluxe Print II	$75.95
Deluxe Video 1.2	$89.95
Deluxe Write	$69.95
Intellitype	$79.95
Logistix	$79.95
Superbase	$99.00
Vizawrite	$79.95

ENTERTAINMENT

Balance of Power	$29.95
Bards Tale	$34.95
Chessmaster 2000	$27.95
Defender of the Crown	$29.95
Deja Vu	$29.95
Earl Weaver Baseball	$34.95
Ferrari Formula One	$34.95
Halley Project	$29.95
Lounge Lizards	$27.95
Marble Madness	$34.95
Racter	$29.95
S.D.I.	$29.95
Sinbad	$29.95
Starfleet I	$34.95
Univited	$29.95

CHOOSE YOUR WEAPON !!

EPYX and WICO

500XJ	$14.95
The Boss	$13.95
Bat Handle	$18.95
3 Way	$26.95

FEDERAL EXPRESS

Software orders over $50.00 & Accessories/Peripherals under 8 pounds will be shipped FEDERAL EXPRESS (Yes even at these prices) You only pay TCP's standard shipping charge of $4.00 per order. **Orders arriving before 11:00 AM our time will be shipped out same day.** If part of your order is back-ordered the remainder will be shipped UPS Ground for FREE!

SECURITY

- Your Credit Card is not charged until your order is shipped.
- We insure your order at no extra cost to you.
- Tussey is a financially strong and well established company. We will be here when you need us.

CUSTOMER SUPPORT

- After sales support. Just call.
- Knowledgeable staff, all graduates of Tussey's "Computer Boot Camp".
- Our advanced warehouse/materials handling system assures your order is shipped out accurately & on time.
- Our IBM 5360 allows instant order and inventory status.

To order by mail: We accept money order, certified check, personal check. Allow 2 weeks for personal & company checks to clear.

Shipping: $4.00 for software and accessories/ $10.00 for printers and color monitors/ $8.00 for disk drives and other monitors/ Add $3.00 per box shipped COD. Call for other shipping charges. Additional shipping required on APO, FPO, AK, HI

Terms: ALL PRICES REFLECT CASH DISCOUNT, ADD 1.9% FOR MASTERCARD OR VISA. All products include factory warranty. **ALL SALES ARE FINAL.** Defective items replaced or repaired at our discretion. Pennsylvania residents add 6% sales tax. Prices and terms subject to change without notice.

- Purchase orders are accepted from qualified corporations and institutions.
- No sales tax on orders outside of PA.
- Buy with confidence. We honor manufacturers warranty.
- We accept Mastercard, Visa, COD and mail orders. *Your credit card is not charged until your order is shipped.*

VISA MasterCard

PRINTERS

PANASONIC

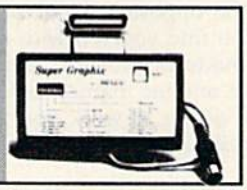
2 yr warranty

1080i	$159.00
1091i	$189.00
1092i	$279.00
1592	$389.00
1595	$439.00
3131	$259.00
3151	$399.00

Xetec

SUPER GRAPHIX JR
Printer Interface $39.95

SUPER GRAPHIX
Interface w/8K buffer
down loadable fonts $59.95



CMS

General Acct System

includes: • General Ledger • Accts Receivable • Billing Statements • Accts Payable • Check Writing • Job Costing • Payroll

Pkg. Price for all Modules:

C128 version	$124.95
C64 version	$119.95

Berkeley Softworks

GEOS 128	$44.95
GEOS	$39.95
Geo Calc	$34.95
Geo File	$34.95
Geodex	$27.95
Deskpack	$22.95
Fontpack	$22.95
Writers Workshop	$33.95

star micronics inc

NP-10	$137.95
NX-10	$157.95

PRICES ARE FALLING ON ALL STAR PRINTERS!!
Call for latest price on
ND-10 ND-15
NR-10 NB SERIES

RGB/COMPOSITE COLOR MONITORS FOR THE 128

COMMODORE 2002
600 x 240 Resolution.
4 Operating Modes
..... $269.00

MAGNAVOX 8562
600 x 240 Resolution.
3 Modes. 2 yr warranty
..... $269.00

THOMSON 4120
560 x 240 Resolution.
4 Modes. 1 yr warranty
..... $219.00

All 3 monitors include cables to Commodore 128

SEIKOSHA

2 yr warranty

SP-180 VC	$139.00
SP-1000 VC	$149.00
SP-1200 AI	$169.00

120cps, NLQ Mode

Abacus

ALL TITLES IN STOCK !!
Call for price on all books and software titles

CITIZEN

120D	$174.00
MSP-10	$279.00
MSP-15	$379.00
Premier 35	$459.00
Tribute 224	$CALL

MODEM MANIA

1670 MODEM ..... $CALL
1200 Baud, w/Software
1660 MODEM ..... $CALL
300 Baud, w/Software
Compuserve St'r Kit. $19.95
Playnet Starter Kit $... 14.95

EDUCATIONAL & CORP ACCOUNTS
CALL 1-800-533-1131
Inside PA Call 814-234-2236

Digital Solutions Inc.

Pocket Writer 2	$42.95
Pocket Filer 2	$42.95
Pocket Planner 2	$42.95
Digital Superpak	$74.95
Dictionary	$12.95

DISKS
per box of 10

BONUS DISKS

SS/DD	$6.45
DS/DD	$6.95

TUSSEY DISKS CLOSEOUTS !!!

SS/DD	$4.49
DS/DD	$4.99

Call for Price on Verbatim and Maxell Disks!!

OPEN: 8:00AM - 9:00PM Mon - Fri, 10:00AM - 6:00PM Sat, 12:00PM - 8:00PM Sun East Coast Time

CALL TOLL FREE 1-800-468-9044

tcp

INSIDE PA CALL 814-234-2236

11/87

EOS: Earth Orbit Stations

EOS is a game that isn't easily defined. In fact, I'm not even sure it should be called a game. The competitive aspects of *EOS* are hardly the focal points of the program—even losers can be successful while winners can fail. No one kills an alien or even takes a shot at one. Of course, maybe that's because there aren't any, at least none that I've discovered.

What I think you have here, cleverly disguised as a game of space exploration, is an educational program that stresses some heavy economic concepts, requires logic and forethought, and eschews violence in favor of equally tense quarterly financial reports.

Earth Orbit Stations (EOS), from Electronic Arts, places from one to four players in charge of the development of an ambitious space exploration and exploitation program. The player must not only determine how to build various space stations, he must also finance them and make them both profitable to run and beneficial, from a research standpoint, to the future of mankind. And you thought clearing out a few monster-infested dungeons was tough!

Basic game play is simple. Players take turns working their way through a series of phases during a fiscal quarter. Each player (computer controlled or otherwise) begins by "launching" his first space station. This is done by placing into orbit the minimum number of special modules necessary to sustain life in space: a command module, life module, logistics module, galley and gym module, and so on.

Once the initial space station is constructed, the challenge begins. New support modules must be added in order to make your station more functional and more profitable. Next, the modules must be graphically set in place and connected to the space station. Placement of modules is not to be taken lightly—the physical placement is simple, but modules can be connected to one another only in a certain manner. Illogical placement of modules can force a player to purchase connecters, thus spending hard-earned money on nonfunctional pieces for the station. Once a module is in position, it cannot be moved.

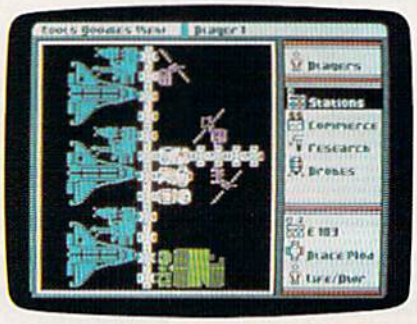
Just as much forethought must be given to which modules are purchased. If you're not careful, you'll quickly find that you have too many production modules without enough support modules to house the crew and supplies necessary to work and produce. Of course, the opposite can occur just as easily: You find yourself with far more support modules than are necessary for your crew, and too many people and an excess of power to work your production modules.

EOS isn't science fiction. The program was designed around NASA plans for the next 50 years of space exploration.

Modules can be set to one of two status levels: Commerce or Research. Modules set to Commerce will, with luck, generate income; modules set to Research will, you hope, make scientific breakthroughs in various fields, earning your station (and you) technical points. The benefits of making money are obvious. The benefits of technical points, however, are just as important. You must earn these points to increase your tech rating; this allows you access to more sophisticated modules, which, in turn, can be used to generate more income or tech points. Of course, all of this sounds easier to accomplish than it actually is.

Each fiscal quarter after the first, a player must examine his income summary, noting both profits and operating expenses, money in the bank, and cash available. Next, he should check the market activity to see what type of ventures are resulting in the most play. Use this information when examining your Commerce modules to determine pricing for your goods and activities.

When examining your Commerce modules, you'll be given information on percentage use of that module or its goods, the price you're charging for the



service, your operating costs, and your profit or loss. This information, combined with the market activity, should dictate your actions on any particular turn.

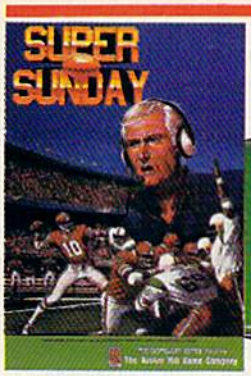
For example, let's assume that one of your modules is a Chemical Lab and you notice that the current demand index for Science and Materials is high. You might wish to increase your price for the goods produced by your Chemical Lab and, in this way, increase your own profits. Conversely, if the demand for Science and Materials is low, you might have to lower your pricing to get any use at all out of your Chemical Lab module.

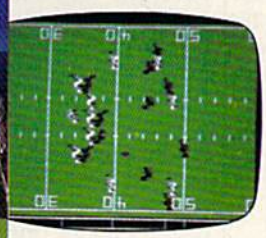
After examining your Commerce modules, check your Research modules to find out if any progress has been made. Research can be one of two types: enhancements or breakthroughs. Enhancements earn fewer tech points but are more likely to take place. Breakthroughs can earn many tech points but are often risky enterprises.

All initial module settings can be changed during a player's turn. Commerce modules can be shifted to research and vice versa. Research modules can change their emphasis from enhancement to breakthrough. When and how these changes occur will determine the success of your space station. Turning a low profit Commerce module into a Research module can sometimes be a very solid strategy.

Just building a Super Earth Orbit Station isn't all there is to *EOS*. The structure of the turns described above revolve around one of seven possible scenarios, each with its own objective. The first mission (a relatively easy scenario designed to introduce players to the game) is called Research. The object in this scenario is simply to develop a steady income so that you can engage

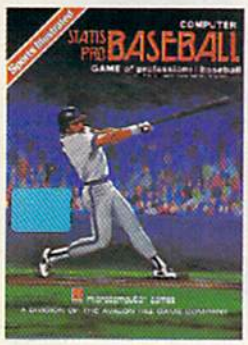
BIG LEAGUE SPORTS





SUPER SUNDAY—Armchair quarterbacks the world over have made SUPER SUNDAY the best selling computer football game . This we attribute to the right blend of graphics, game play and especially statistics, because that's what sets Avalon Hill sports games from the pack. The vicarious experience of coaching real-life players, second guessing your computer or human opponent and the feeling of BEING THERE will send you back to SUPER SUNDAY over and over again. Support of the game system also makes it distinct. You can get the entire '84, '85 or '86 season disks with rosters and stats for all the big league team starters and interchange teams of the past and present. The all new General Manager's Disk (also available separately) allows you to create "dream teams" in setting up your own Pro Football draft. Available for Apple® II, C® 64/128, IBM® PC for $35.00

NBA—We have taken the same concept as SUPER SUNDAY from the field and put you down on the court in NBA, the definitive pro basketball game. Licensed by The National Basketball Association, NBA gives you the same flexibility, visuals and real-life player stats so you can coach the Celtics dynasty, Kareem, Magic and the Lakers or eighteen other great pro B-Ball teams. Available for Apple® II and C® 64/128 for $39.95; IBM® coming soon.



STATIS PRO BASEBALL—It's funny that America's favorite sports pastime has not been our best selling computer sports game. Maybe it's because you haven't known about it 'til now. COMPUTER STATIS PRO BASEBALL (based on our best-selling board game) has elicited countless letters of praise from computer baseball fanatics and stat buffs alike. Although it lacks the graphic flair of SUPER SUNDAY and NBA, it's a dandy of a stat baseball game ... and offers more game utilities right on the Master Game disk than any others—such as DESIGN YOUR OWN TEAMS, STAT COMPILER and DRAFT YOUR OWN TEAMS functions. Also, we offer ten past season disks. Available for Apple® II and C® 64/128 for $35.00

Look for our games wherever good software is sold, or call direct for ordering information ... AVALON HILL, the first name in sports and strategy games!

Dial **1-800-638-9292**. Ask for Operator CG12.

microcomputer games DIVISION

The Avalon Hill Game Company

A MONARCH AVALON, INC. COMPANY

4517 Harford Road ★ Baltimore, MD 21214

in research. The winner is the Space Director (player) who earns the most tech points by the end of eight fiscal quarters, which translates to two years.

A more advanced scenario is Search for Life. Here you must launch probes to other worlds, build huge Life Science/Cargo liners, Jupiter Explorers, and Research Colonies to investigate potential life sources on other planets. You have ten years to report discoveries.

Other scenarios require that you build space hospitals, lunar settlements, and orbiting space colonies. Scenarios tend to build on one another, although there is nothing that dictates a particular playing order. It's just that the sophistication level of the missions increases and expects more expertise on the gamer's part if success is to be achieved. And as in any endeavor, experience plays a major role in a rewarding outcome.

EOS isn't science fiction. The program was designed around NASA plans for the next 50 years of space exploration. Many of the space modules from which you can choose are either currently functional or under development. This game provides the player with a much better understanding of just what it's going to take to truly conquer space. I am not a space buff and I was astonished at the enormity of the task of just putting together a station, and I was amazed that the technology is developing to actually accomplish this task. That's part of what I meant about *EOS* being educational.

Besides the obvious strengths of the program as a learning device, *EOS* possesscs a variety of other nuances that teach while entertaining. Launching probes is exciting; however, to do so, a player must determine where to send the probe. The *EOS* Orbit Library lists all the planets and moons in our solar system.

Making a profit from your Commerce modules provides great satisfaction; however, to maximize those profits, a player must learn to use the power of advertising to promote his products. Of course, the player must decide how much advertising is beneficial. It takes money to make money, so loans may be taken from the bank to finance expansion of your Earth Orbit Station. Money borrowed must be paid back—overextending yourself results in bankruptcy and the loss of your station. All of these situations are fun to role play, teaching economics while they entertain.

From a graphics standpoint, *EOS* does a nice job of depicting the shuttle modules and overheads of space cities. There is a limit to the variety of graphics, though, and they become, by the very nature of the program, repetitive. Text is clear and easily accessible, thanks to the use of pull down windows, dialogue boxes, and other Macintosh-like menus.

EOS excels, too, in the area of replay value. Although seven scenarios may not sound too impressive, all the scenarios are replayable and each scenario lasts from 2 to 40 hours. Add to this the fact that you have 39 different modules from which to construct your station and you have enough variety at your disposal to play *EOS* time and time again without repetition and boredom creeping into the picture.

EOS is a unique program, more of a simulation of the future than a game in the truest sense of the word. It's one of those products that appears simple on the surface but can be incredibly complex when pushed to its maximum capacity (the rule book is only 14 pages in length, and that includes five pages of appendices and mission descriptions). Fascinating and challenging, *EOS* will provide adults of all ages with many hours of play. It is sure to stimulate both your intellect *and* your imagination.

—James V. Trunzo

Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
$29.95

Dan Dare: Pilot Of The Future

Comic book hero Dan Dare hits the interactive screen here, striving with his pal Stripey to rescue Digby the spaceman and Peabody the professor. They've been captured by the profoundly evil Mekon, who has the gall to face Dare from his control dome and shoot energy bolts at him, trying to prove that while energy can never be destroyed, comic book heroes definitely can.

But getting to Mekon is definitely more than half the fun. Dare starts the adventure on the surface of Mekon's asteroid, where he must fight his way past a host of despicable green things called Treens and open three hatches that lead down to the prison complex. Actually, he need open only one, but unless he finds all three, he can't rescue both Digby and Peabody and still manage to get past Mekon.

And finding all three isn't easy. Dare will need a crowbar to pry open jammed hatches and a tree branch to open electrified ones. A third hatch is accessible only with the help of his pet Stripey, who spends most of the adventure leaping about all around Dare, not bothering to help when he's called upon. If it weren't for the SPCA. . . .

Once in the prison complex, Dare has two tasks. First, he must find the two prisoners (Digby and Peabody) and free them from their cells. Here, he'll need passes that open the doors between rooms. To get these, he must beat up another batch of Treens, who seem highly unwilling to cooperate with him. Eventually, after climbing ladders and trying several rooms, he'll find the prisoners and release them.

Dan Dare *is fun for all, playable by kids and adults.*

Once that task is completed, he's ready for the second—diverting the giant industrial laser. The complex contains three controlling computers, and the only way for Dare to reach Mekon is to destroy all three. You see, the computers are in charge of the asteroid's collision course with earth, and since the asteroid contains an atomic bomb, Dare must destroy it to save the world. For most of us, it's the mission of a lifetime. For Dare, it's merely another annoyance in the day-to-day life of a superhero.

Destroying the computers is a matter of turning a series of reflectors to direct the laser beam toward the computers. In many ways the least satisfying portion of the adventure, this section demands a great deal of running back and forth to figure out which way to turn the reflectors. The section is also—and I can hardly believe I'm writing this—far less realistic than the others. Finding the prison complex seems reasonable as does exploring the prison complex to find the prisoners, but what's a laser doing here, especially one whose only function is to destroy the asteroid's controlling computers? If you're Dan Dare, it's a wonderful thing to find, but its purpose is at best obscure.

Once the computers are destroyed, Dare finally reaches Mekon. Dan's object here is to avoid getting zapped long enough to use his grenades to destroy the dome and escape back to his ship. I would like to give a play-by-play of what happens here, but my Dare has never destroyed the dome. The first time he reached Mekon he was so overwhelmed, he decided that death was superior to this kind of excitement. In other attempts, he used Mekon's chamber to display new levels of tactical incompetence and died even faster. Since the game cannot be saved, once Dare dies he must start from the surface again, so playing time becomes a factor.

All these activities are controlled entirely by joystick. Movement, boxing, and grenade tossing are fairly standard, but an impressive element is the decision-making. When Dare finds something—a hatch, a crowbar, the reeds, the laser—the screen displays a printed message—for example, "Dan treads on something." Pressing the fire button reveals the choices, which you cycle through by moving the joystick lever. When you reach the one you want, simply release the fire button and Dan will do as you've decided.

What this simple interface means is that the game is playable by anyone who can read the messages—kids, for instance. My eight-year old has been playing it regularly, and except for the rather clumsy boxing system, she does very well. She wishes Stripey did more

COPY II® 64/128

NEW Version 3.1

BACKUP PROTECTED SOFTWARE FAST.

From the team who brought you Copy II for the Apple, the Macintosh and the IBM comes a revolutionary new copy program for the Commodore 64/128 computers.

- Copies many protected programs—automatically. (We update Copy II 64/128 regularly to handle new protections; you as a registered owner may update at any time for $15 plus $3 s/h.)
- Copies even protected disks in under 2 minutes (single drive).
- Copies even protected disks in under 1 minute (dual drive).
- Maximum of four disk swaps on a single drive.
- Includes fast loader, 12-second format.

Requires a Commodore 64 or 128 computer with one or two 1541 or 1571 drives.

Call 503/244-5782, M - F, 8 - 5, (West Coast time) with your VISA in hand. Or send a check for $39.95 U.S. plus $3 s/h, $8 overseas.

$39.95

Central Point Software, Inc.
9700 S.W. Capitol Hwy. #100
Portland, OR 97219

Central Point Software INCORPORATED

Call for a catalog of our full product line.

This product is provided for the purpose of enabling you to make archival copies only.

than just bounce around (he does, but not much) and that Dan didn't die so easily (he is, after all, a comic book hero). Aside from that, she finds the quest interesting and the game thoroughly enjoyable. Since I did as well, I have no trouble recommending the game. And since it's from Electronic Arts' new moderately priced Amazing Software series, I can even recommend it financially.

On to the asteroids to face Mekon!

—Neil Randall

Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
$19.95

1541/1571 Drive Alignment System

If you have trouble loading commercial software, the software may not be at fault: Your disk drive may be misaligned. This is a serious problem, but not so dire as it may sound. Software is available to help you realign your misbehaving disk drive.

The 1541/1571 Drive Alignment System from Free Spirit is a fine piece of reasonably priced software aimed at solving alignment problems. The program can easily and profitably be used by anyone with modest mechanical background or ability. With it, I realigned my slightly out-of-adjustment 1541 in less than an hour. To be fair, I had worked with another alignment program before, which saved me considerable time. Nonetheless, *this* job was easier and less time-consuming even discounting my previous experience.

The program can easily and profitably be used by anyone with modest mechanical background or ability.

Aside from ease of use, Free Spirit's program has a number of features to recommend it. It works on both 1541 and 1571 drives (there are also special instructions for the SX64). All software is contained on one double-sided disk (no other correctly aligned reference disk is required). A half-track position test allows you to fine-tune the alignment, and a special procedure permits loading the program even when the drive will load nothing else. In addition, the program autoboots on the 128.

As you would expect, Free Spirit has incorporated motor-speed and head-stop-position checks into the program. All tests are fast and give instant feedback.

The brief, eight-page manual is satisfactory, offering a modest number of helpful disassembly diagrams. Of course, for the uninitiated, *no* number of diagrams is sufficient: You could always use more! And it seems that the number of screws is *never* what the manual indicates and that your particular drive *always* looks different from the picture. The real problem here is that there are so many models and minor variants of Commodore drives that, until you find your way around, things are likely to be a little confusing. All in all, the documentation does a reasonable job of coping with these variants. The strength of the package, though, is the program itself—something you will appreciate time and time again.

I recommend this software to those who do their own alignment on an ongoing basis (a simple program run shows whether or not adjustment is needed). For the neophyte ready to tackle his or her own disk drive, I offer four suggestions. First, be patient—it gets easier. Second, take the program's safety advisory seriously, especially the part about *disconnecting the power.* Next, use the appropriate type and size screwdriver (the only tool required); the stepper motor set screws are very tight if they've not been previously removed. Finally, the adjustments are not just tiny; they are *miniscule* (the manual aptly uses the term "microscopic").

Free Spirit's alignment system is an excellent, efficient program that can help you save both money and down time.

—Art Hunkins

Free Spirit Software
538 S. Edgewood
LaGrange, IL 60525
$34.95

COMPUTE!'s GAZETTE
TOLL FREE
Subscription Order Line
1-800-727-6937

EXPERIENCE THE THRILL OF GAMBLING

with **VEGAS GAMBLER** and **VEGAS CRAPS**, the sensational new releases from California Dreams.
Feel the excitement of your favorite games with **VEGAS GAMBLER**'s slots, blackjack, poker, and roulette.
Place your bets and throw the dice with **VEGAS CRAPS**, a true to life simulation of a casino craps table.
Play for fun or to sharpen your gambling skills.
Be a winner! Pick up your copies today!

California Dreams™
All Rights Reserved.
©1987 Logical Design Works, Inc.
780 Montague Expwy., Suite 403
San Jose, CA 95131 U.S.A. (408) 435-1445
IN EUROPE (Geneva) Tel. 022/31 9752

Available now for C 64/128 and Atari ST (color & mono)
Soon to be released for IBM PC, Apple II, and Amiga

Street Sports Baseball

What could be worse than an American man admitting he doesn't like baseball?

I don't like baseball. Hot dogs and Chevrolets are all right. And, of course, I'm crazy about Mom and her deep-dish apple pie. But baseball I have never liked.

It probably stems from being gawky as a kid. I couldn't run. I couldn't field.

Like all the other neighborhood kids, I admired my brother's ability to send the center fielder into the cornfield across the road to search for his pop flies. But I was such a miserable hitter they had to allow me ten strikes—and I was likely to strike out anyway.

I don't like baseball.

But I do like *Street Sports Baseball* from Epyx.

The game requires one or two joysticks (depending on the number of players), and it loads from a single side of a single disk.

As in real baseball, the strategy begins long before the players hit the field. The first choice is between two playing fields—a blacktopped parking lot and a grassy vacant lot studded with stumps. The bases are shingles and old tires. Garbage can lids serve as the pitcher's mound and home plate. Although it's nice to have a choice of playing fields, the action didn't appear to be different.

The next choice to be made is whether to play against another human or against the computer. I must warn you that the computer is good. It's able to do things I was never able to do, like make double-plays. On the other hand, it will never get you into a pickle, stuck between bases as the fielders play catch over your head. Also, the computer is a very conservative player. When the ball is thrown toward the infield, its players turn around and head back to the last base they touched, even if they were nearly to the next base.

After the field has been selected and you have decided whether to play the computer or another person (a choice that requires two joysticks), you are presented with a group of bored-looking kids hanging out on the steps of tenements, waiting for something interesting to happen. Unlike the picture on the instruction manual and the program packaging, the kids don't look like extras from Michael Jackson's *Beat It* video. They're just ordinary kids. I'm sure the aura of urban life was entirely intentional—and perhaps necessary. The name *Street Sports Baseball* has an attractive raffishness about it missing in possible alternative titles like "Sand Lot Baseball."

At this point, you are given the option of choosing your team, of allowing the computer to choose at random for you, or of loading a previously saved team from disk.

If you decide to pick a new team, the order of choosing is decided by the toss of a coin. You and your opponent will take turns choosing players. When you press the joystick to the left or right, another player will appear in the small window on the upper left of the screen, along with a brief list of the player's talents and quirks.

Dana, for instance, is excellent in center field. She rarely misses a fly ball. But if she's hit a grounder and has to throw the ball, an ice age could pass before it arrives at home plate. She has a keen eye but a weak arm. The rest of the players have similar trade-offs of skills and deficiencies.

Your role is more like manager than player. Still, to a great extent, your joystick and fire button skills will make the difference between winning and losing.

You will have to keep these deficiencies in mind when assigning the players their positions on the field and their batting order; their fact sheets don't appear at that juncture. Fortunately, the players' qualities are also listed in the instruction manual, so you can refer to it when placing your players.

Once started, the game is simple. When you are at bat, your player swings when you press the fire button. The run to first base is automatic, but you must hold the firebutton down to make your player continue for doubles, triples, or home runs. Pulling downward on the joystick makes your player slide.

When you are pitching, things get a little more complicated. You have to control three outfielders, four infielders, and the pitcher. Fortunately, you control only the player in the immediate vicinity of the ball. When you press the fire button, the pitcher winds up and throws. Pulling down on the joystick causes the pitcher to throw a fast ball; pushing up, a slow ball. Pushing the joystick to one side or the other makes the ball curve. All of these controls work as long as the ball is in flight. In other words, you can throw a slow ball that suddenly picks up speed. Or you can curve a ball far to the left or right and still make it home in on the plate.

When the batter hits the ball, the screen switches to the outfield. If the screen doesn't show an outfielder, move the joystick. Soon he or she will come running out.

In a window to the left, you can see the relative positions of all the players and the ball. When going after fly balls, the fielders have to watch out for hazards that litter the field. The parking lot, for instance, has trash cans and oil slicks. Catching the ball is no trick, unless the player is clumsy and falls over an obstacle—or unless the player just isn't very good.

For an embarrassingly long time, I couldn't figure out how to get the ball to second base from the outfield. Finally I decided to cheat and read the instructions. To throw from the outfield to second base, the joystick must be pressed up. This is an extremely unnatural movement, and, even after I was aware of it, I was unable to remember to do it when playing the game. The four joystick positions refer to the four bases and not to the direction thrown.

The hardest thing to get used to (and this is strange because it is probably the most realistic feature of *Street Sports Baseball*) is that the quality of play is much more dependent on the quality of the players than on your skills. Some players will strike out no matter how good you are at pressing the firebutton. Others seem to hit everything that comes their way. Your role is more like manager than player. Still, to a great extent, your joystick and fire button skills will make the difference between winning and losing: When a bad player is up at bat, you just have to be that much better, to make up for his weakness.

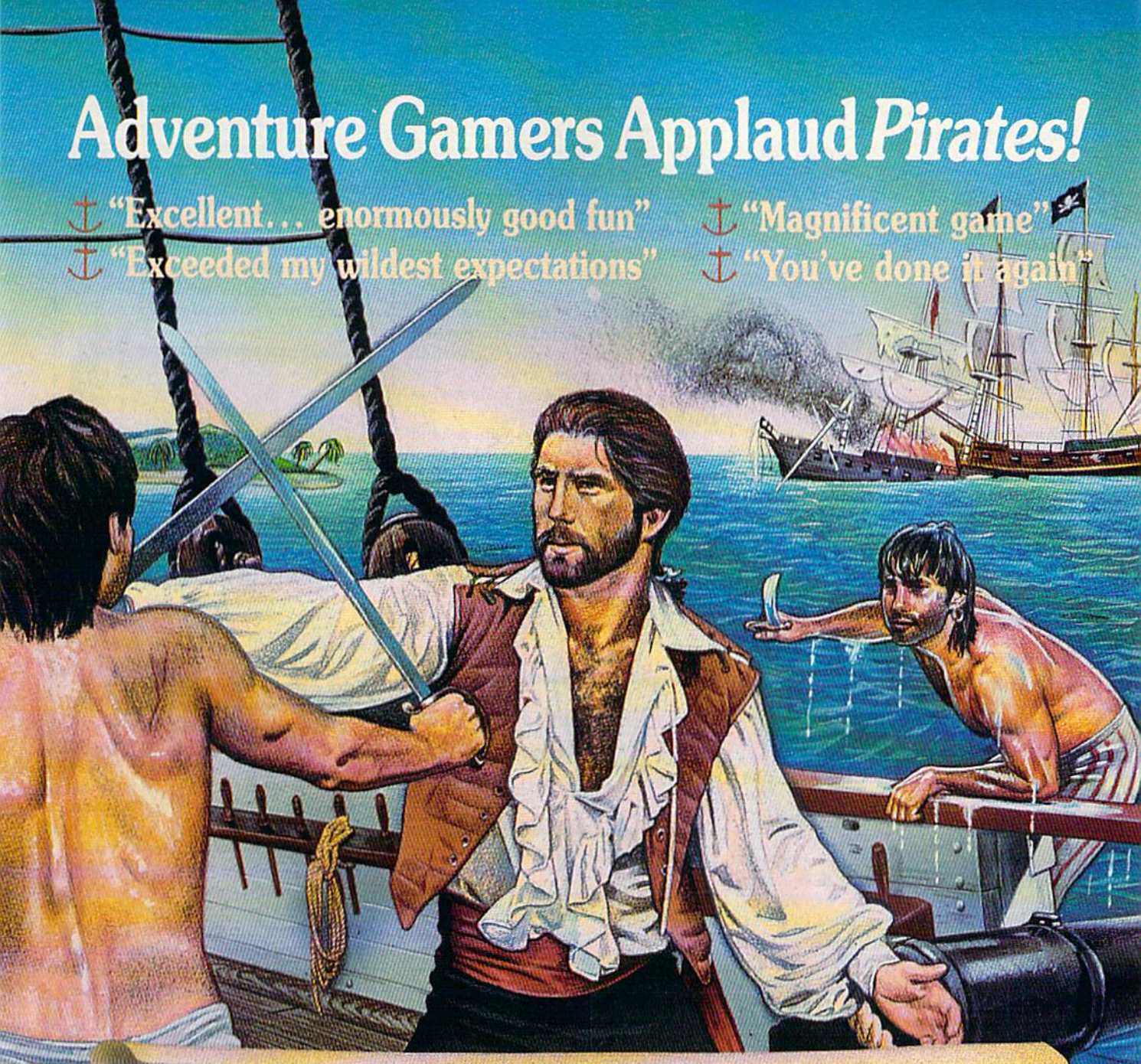
The use of sound in *Street Sports Baseball* is incidental—an occasional horn or siren will go by. The animation is of the high quality you would expect if you've seen one of Epyx's earlier offerings (*Summer Games*, for example). The kids are life-like and likeable: You'll catch yourself rooting for them.

Street Sports Baseball comes with a teaser on the back of the disk: a brief look at the next Epyx game, *Street*

Adventure Gamers Applaud *Pirates!*

⚓ "Excellent... enormously good fun" ⚓ "Magnificent game"

⚓ "Exceeded my wildest expectations" ⚓ "You've done it again"



"**PIRATES!** *is excellent... a great swashbuckling game,* **enormously good fun**... *it should keep you playing for months.*"
(Popular Computing Weekly, U.K.)

"*...your game has* **exceeded my wildest expectations**... *I have run up more game time on the computer in 3 days than in the entire month previous.*" **(C.J.M., Buffalo, N.Y.)**

"*This is one of the most* **magnificent games** *I have ever had the pleasure of playing! It has exactly the balance of realism, playability and silliness that I most adore.*" **(J.P.S., San Diego, CA)**

"**PIRATES!** *is a big hit in the Dallas area. This game is one of your best efforts. The graphics on all screens are excellent!* **You have done it again,** *Microprose.*"
(Larry Medlin, DallasGamers, in Game News)

PIRATES! It's another winner from Sid Meier, author and designer of the award-winning F-15 STRIKE EAGLE and SILENT SERVICE. His creative genius has combined the best of simulation, role-playing and strategy games in this high seas adventure.

You're a 17th century privateer captain in the thick of the action on the Spanish Main. **PIRATES!** challenges your reflexes in simulated sailing, sea and land battles and swordfights. It tests your cunning in bargaining with merchants and negotiating with government officials. From the romance and intrigue of more than 50 foreign ports to the thrill and excitement of buried treasure, **PIRATES!** takes you on an exhilarating quest for power and prestige.

PIRATES! is available at your local "Valued MicroProse Retailer" (VMR). Call for locations nearest you. Get it today for Commodore 64/128, IBM-PC/compatibles and the Apple IIc and 128K IIe. Call or write for MC/VISA orders if product not found locally.

MICRO PROSE™
SIMULATION • SOFTWARE

180 Lakefront Drive • Hunt Valley, MD 21030
Information and Orders: (301) 771-1151

Sports Basketball (scheduled for release by the time you read this), which looks like another winner.

—*Robert Bixby*

Epyx
P.O. Box 8020
600 Galveston Rd.
Redwood City, CA 94063
$39.95

The Advanced OCP Art Studio

There are scores of art and drawing programs for the Commodore 64 on the market. These range in complexity from simple children's onscreen coloring books, through basic drawing programs, to those which incorporate more sophisticated texture and shading techniques. For most people, these programs are quite satisfactory. They take advantage of Commmodore's superior color capabilities, put the user's creativity to work, and produce attractive pictures. Now comes a program designed for the more discriminating computer artist.

The Advanced OCP Art Studio from Rainbird Software (distributed in the U.S. by Firebird) is actually two programs in one. There is one disk (or tape) and manual for *Art Studio* and a second set for the *Advanced Art Studio*. (OCP, by the way, is the company that designed the program.)

In both levels the user interacts with the program using pull-down menus. Only those options that are valid at a particular time are displayed. Both programs support multiple input devices including a joystick, mouse, Koalapad, and the keyboard, although only one of these can be active at a time.

Windows or subsections of the screen can be manipulated in formats that include flipping, rotating, shrinking, or stretching.

There are three levels of magnification for close-up pixel-by-pixel editing. A special function is available in this mode which enables more precise drawing by overlaying a grid on the screen. Usual drawing functions including lines, circles, and boxes are provided, along with an ability to draw triangles. Text in one of nine sizes can be entered onto the screen. Text fonts can be edited and saved to disk or tape to create libraries of fonts for later use. Finally, drawings may be stored on disk or tape. Sample artwork is already on disk to whet your appetite.

Both programs allow printouts. They were initially written to use the Commodore MPS-801 printer, but through a special BASIC configuration program, almost any dot-matrix printer that supports bit-image graphics can be used. Setting this up is no trivial task: The configuration program, in effect, guides you through the generation of a printer driver, and it assumes you are very familiar with the operation of your printer. You need to know such things as how many print wires are in the head, which bits control which wires, what codes to send to enter and leave graphics mode, how many dots there are per line, and so on. All this information should be in your printer manual, but be prepared to experiment until you get it right. Once you successfully complete your driver, however, all your artwork can be printed in various sizes, and even sideways.

Each program comes with a stand-alone screen-loader program (again written in BASIC and available to LIST and modify) that allows you to load screens of artwork you have created with *OCP Art Studio* into your own programs. This is a tremendous feature if you're doing any serious programming, and it can give your programs a truly professional look.

If anything can be done to a picture or a portion of it, this program does it.

The manuals for both programs are comprehensive and coherent. For the programmer they contain a wealth of technical information. For the artist, they offer guidance in obtaining the best and most creative results.

While the programs have much in common, they also differ. The first program, *Art Studio*, allows you to work in hi-res mode (320 × 200 pixels). You have 16 pens, 8 random sprays, 16 user-definable brushes, and 32 user-definable patterns to choose from, with 16 colors in which to use them. Although the brushes and patterns may be edited to suit your needs, the newly created patterns cannot be saved.

Advanced is the appropriate word in describing the differences between *Art Studio* and *Advanced Art Studio*. *Advanced Art Studio* gains its power through the use of Commodore's multicolor bitmapped mode. This mode sets up "cells" consisting of four pixels in the *x* direction and 8 pixels in the *y* direction. Up to four colors may be displayed in each cell. This, combined with a unique feature in the Colours menu, gives you great control over detail. In the Colours menu, you have the ability to exclude up to 15 of the 16 colors and to create a priority list among the rest. This enables you to position parts of your drawing in front or back of others. It also prevents some of the "bleeding over" of colors when working in detail so common in other programs.

The Advanced OPC Art Studio has 16 drawing pens, 8 random sprays, 12 user-definable multicolored brushes and 12 user-definable patterns. Here, when patterns or brushes are modified, the new ones may be saved to tape or disk.

OCP Art Studio has far more features than can be adequately described here. If anything can be done to a picture or a portion of it, this program does it. What makes this package special is its level of sophistication. It is not for the average doodler—although an ambitious one could learn a lot from it. Rather it is for the serious computer artist who can use it to its fullest potential. It requires a knowledge of color and artistic technique as well as an understanding of how a computer manipulates design and color.

Those who may appreciate this program most are programmers trying to create background screens for their programs. But users who wish to develop expertise in computer art—those willing to spend time following the manuals and experimenting with the programs—will find *The Advanced OCP Art Studio* an excellent place to learn.

—Robin and David Minnick

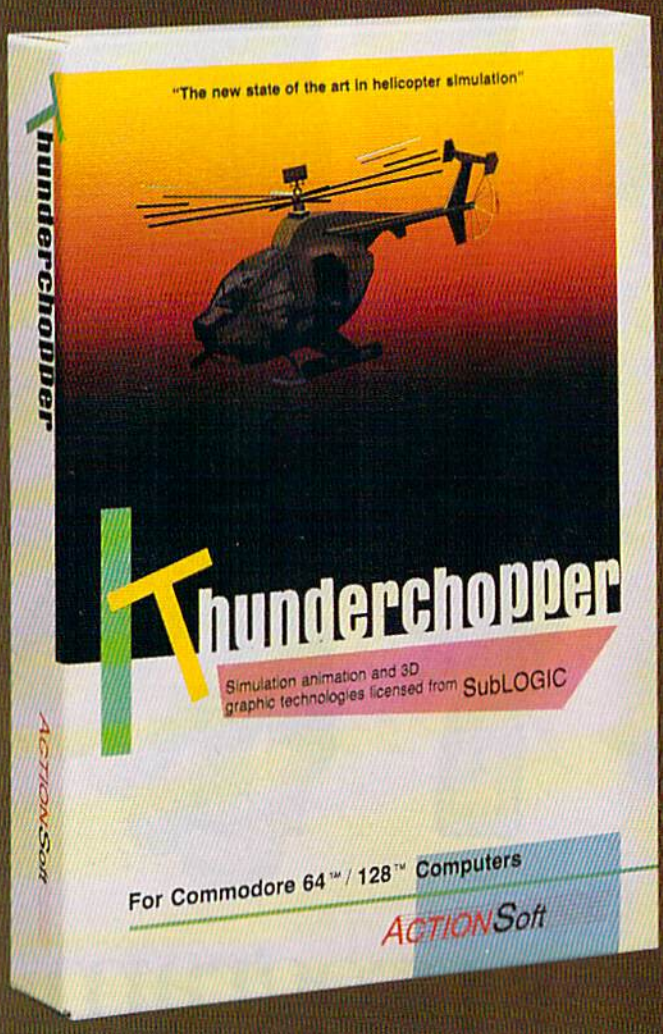
Rainbird (Firebird Licensees)
P.O. Box 49
Ramsey, N.J. 07446
$39.95

This fall's hot new program stars 4 sexy Europeans and 1 American stud.

This fall's sizzling new program doesn't feature an Alexis, a Krystle, or even a Magnum, but it will have some pretty racy scenes. • Meet the exotic cars of Test Drive, Accolade's incredible driving simulation. There are the legendary greats from Europe: Ferrari Testarossa, Lotus Turbo Esprit, Porsche 911 Turbo and the incomparable Lamborghini Countach. And to make Test Drive a truly international event, there's the classic American star—the Chevrolet Corvette. • Test Drive allows you to experience firsthand the awesome driving characteristics of each renowned performer. They accelerate like the real thing. They handle like the real thing. They brake like the real thing. In fact, the animation and graphics of Test Drive are so realistic, you'll swear the G-Force has you pinned to your seat. • Accolade's Test Drive. It's one program that will definitely burn up the screen. • Accolade.
20813 Stevens Creek Boulevard, Cupertino, CA 95014. 408-446-5757. ACCOLADE™

TRADEMARKS/OWNER: CORVETTE/GENERAL MOTORS CORPORATION; LOTUS/LOTUS PERFORMANCE CARS, L.P.; FERRARI/FERRARI S.P.A.; PORSCHE/PORSCHE CARS, INC. AND; LAMBORGHINI/LAMBORGHINI CARS, INC.

FINALLY, A CHALLENGING HELICOPTER


"The new state of the art in helicopter simulation"
thunderchopper
Thunderchopper
Simulation animation and 3D graphic technologies licensed from SubLOGIC
ACTIONSoft
For Commodore 64™ / 128™ Computers
ACTIONSoft

Sure, our competitors have their own versions of what they believe to be realistic helicopter simulations. But they're either too **SUPERSIMPLE** or they make helicopter flight a true **HARDSHIP**. Only ThunderChopper's advanced flight systems, graphics, and game-playing strategies provide the perfect combination of challenge and fun.

-$29.95-
Better Engineering at a Better Price

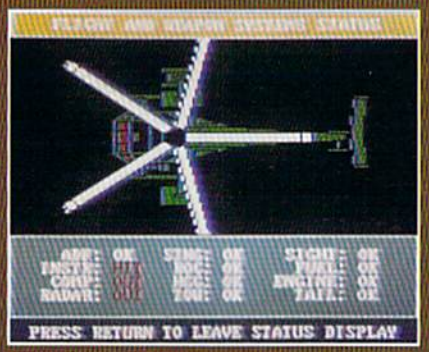
ThunderChopper puts you at the controls of an advanced Hughes 530MG Defender. This high-performance scout/rescue/attack helicopter has the enhanced power and controllability not found in today's helicopters – or helicopter simulations. ThunderChopper's combination of power plus control lets you land on helipads or rooftops with ease. With enough experience you'll be ready to test your skills in a variety of dramatic escort, land and sea rescue, and combat scenarios.

High-speed 3D animated graphics, courtesy of SubLOGIC, offer superb out-the-window views in day, dusk, and night flight modes. ThunderChopper's sophisticated instrument panel lets you scan all vital information at a glance. An onboard flight computer provides mission instructions and pilot performance feedback. Advanced instrumentation includes Forward-Looking Infrared, CO2 laser radar, and zoom television. Armament consists of TOW and Stinger missiles, a Hughes Chain Gun, and Zuni rockets – ThunderChopper's 750-horsepower jet turbine and precise controls provide the power and maneuverability to use them all effectively.

Superior programming and documentation design gets you up and flying in minutes. Flight techniques and combat strategies by Colonel Jack Rosenow, USAF (Ret.) provide all of the helicopter action and realism you've been looking for.

From simple landing practice to the most dangerous combat mission, ThunderChopper is the perfect combination of challenge and fun. ThunderChopper, truly generations ahead of the pack!

SIMULATION THAT'S ALSO FUN TO FLY!



C64 Screens shown. Other computer versions may vary.

Up Periscope!

And don't forget Up Periscope!, the new state of the art in submarine simulation. For the ultimate in submarine action and realism, nothing else even comes close.

Up periscope!
Simulation animation and 3D graphic technologies licensed from SubLOGIC
"The new state of the art in submarine simulation!"
For Commodore 64™/128™ Computers
ActionSoft

See Your Dealer...

Or write or call for more information. ThunderChopper is available on disk for the Commodore 64/128 and AppleII computers. Up Periscope! is available for the C64/128 and IBM PC. For direct orders please specify the program and computer version you want. Enclose $29.95 plus $2.00 for shipping (outside U.S. $6.25) and specify UPS or first class mail delivery. Visa, Mastercard, American Express, and Diners Club charges accepted.

© 1987 ActionSoft Corporation
3D graphics and special effects courtesy SubLOGIC Corp.
Commodore 64 and Commodore 128 are registered trademarks of Commodore Electronics Ltd.
Apple is a registered trademark of Apple Computer, Inc.
IBM is a registered trademark of International Business Machines Corp.

ACTIONSoft
"GENERATIONS AHEAD IN STRATEGY ACTION SOFTWARE"
201 WEST SPRINGFIELD AVENUE, SUITE 711
CHAMPAIGN, IL 61820 (217) 398-8388

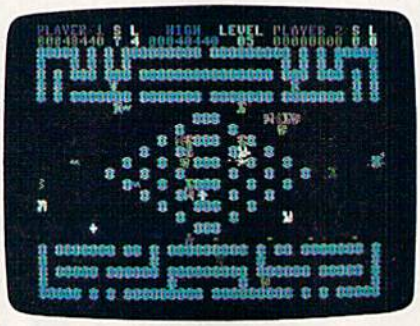
Crossroads

Steve Harter

In this arcade-style game, one of the best we've ever published, you battle a host of hostile, mutant creatures. The fight takes place in a maze—which is different at each level. You progress by capturing "spars"—whirling fans with magical properties. On each level, you'll encounter new hordes of monsters. For the 64, one or two players. Joystick(s) required.

Carefully, you lean out into the hallway. Looks clear. Eerie, how there's no sound. With so many creatures near, you'd think you would hear something. They're just waiting for you, probably, hunched over an illegal dice game, or digging through a garbage can for scraps of food.

You need to catch one more spar to move on to the next level. Now you can hear one whirling down the hall. Well, no choice really—better move. You run down the hall, looking down each hallway you pass. Trouble. One hall harbors a group of dangerous monkeys. A particularly nasty one looks up and stares right into your eyes. You see him reach for his gun. Panicked, but trying to look cool, you fire a few blind shots and move on, sweating. They're on your tail now, no doubt about it.



A unique and challenging action-packed game, "Crossroads" features several mazes and nine different enemies—each with its own personality.

Just when you think you've got them licked, you run almost head-on into a blue rubberhead. It bellows in anger. No time to shoot. You duck down a hall. There's the spar. You can hear the rubberhead screaming behind you as it starts to shoot. But you've won this round—on to the next level of "Crossroads."

Crossroads is a game that features nine different types of enemies. You—alone or with a friend—must battle these frenzied, aggressive creatures in a series of different mazes.

Getting Started

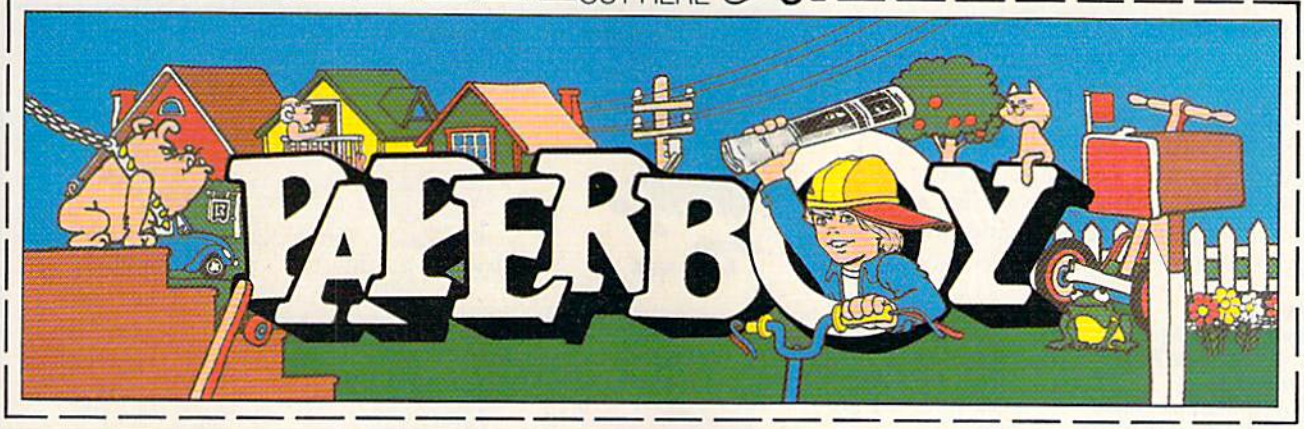
Crossroads is written entirely in machine language. Type it in using "MLX," the machine language entry program found elsewhere in this issue. When you run MLX, you'll be asked for the starting and ending addresses for the data you'll be entering. For Crossroads, respond with the following values:

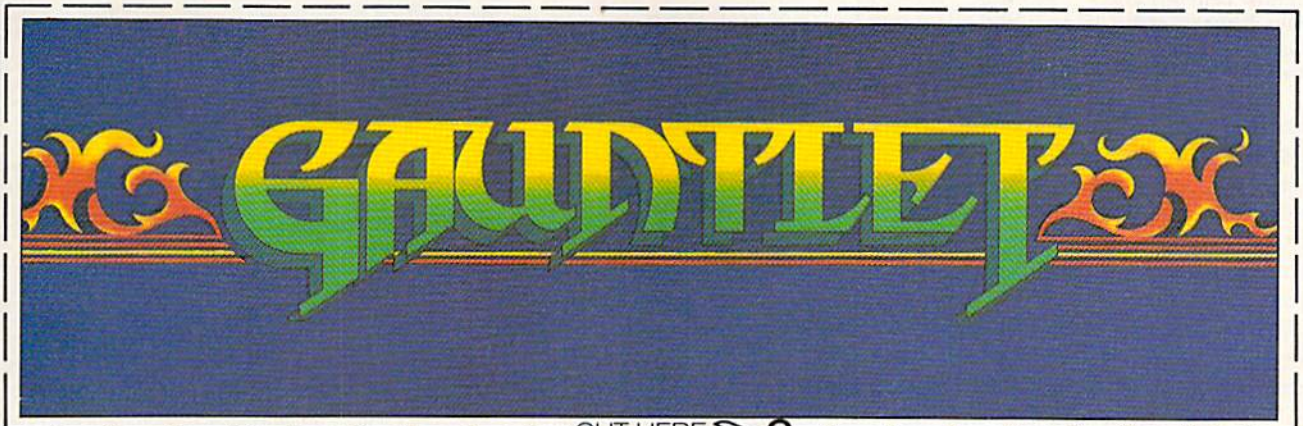
Starting address: **0801**
Ending address: **1F30**

Be sure to save a copy of the program to tape or disk before exiting MLX.

Crossroads loads and runs like a BASIC program. When you're ready to play, plug a joystick into port 1 (or plug in two joysticks for a two-player game), load the program, and type RUN.

CUT HERE





CUT HERE

CAN YOU CUT IT?

Can you handle the excitement of the hottest arcade megahits?

Then cut out these name plates, mount 'em on your monitors and boot up *Gauntlet*™ and *Paperboy*™ from Mindscape. That's all you need for absolutely outrageous arcade action, right at home.

You'll get real arcade graphics. Real arcade feel. Real arcade excitement. After all, these are based on the real arcade classics. So get set, get psyched for the arcade to hit home. Just pick up new *Gauntlet* and *Paperboy*. That is, if you think you can cut it.

Mindscape takes the arcade home.

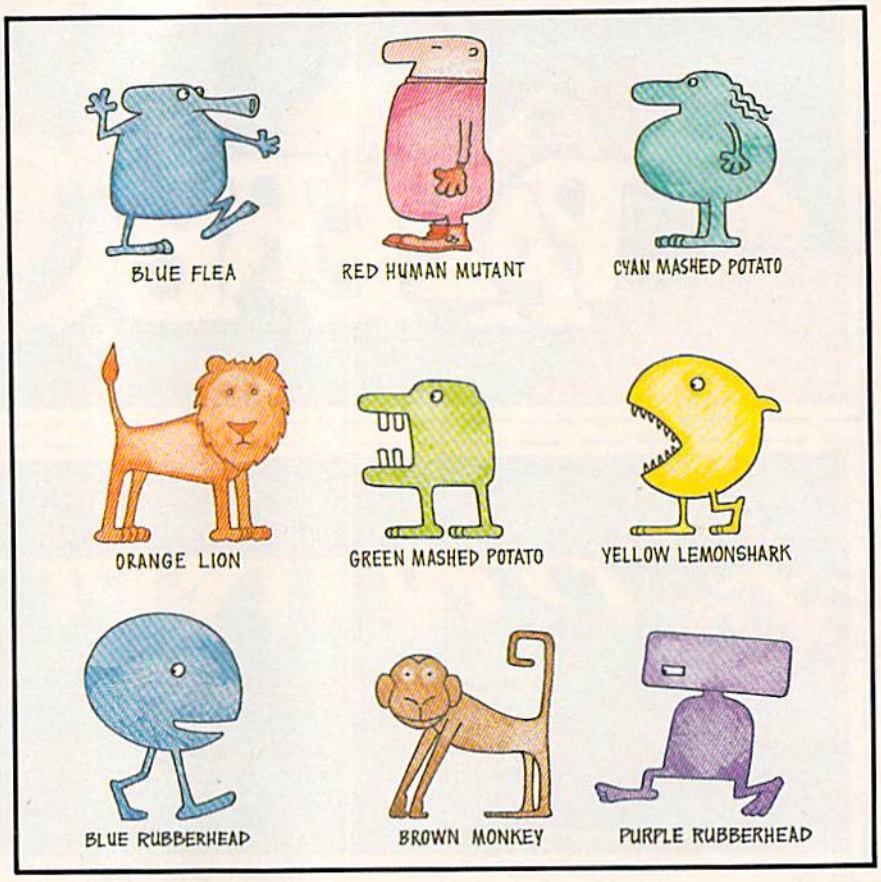
MINDSCAPE INC

Visit your retailer or call 1-800-221-9884 for VISA or MasterCard orders. To purchase by mail, send your card number with expiration date, check or money order for $34.95 each (C64/128 and Atari 800), or $49.95 (Atari ST, Paperboy only) plus $3.00 for handling to Mindscape, Inc., P.O. Box 1167, Northbrook, IL 60065-1167. Allow 3-5 weeks for delivery. Legal eagles take note: © 1987 Mindscape, Inc. Mindscape is a trademark of Mindscape, Inc. Paperboy™ © 1984 Atari Games. All rights reserved. Gauntlet™ © 1985 Atari Games. All rights reserved.

An Enemy At Every Turn

When Crossroads starts, several monsters are transported into the maze. This is your opportunity to see how various species interact; for example, monkeys and rubberheads are bitter enemies. Here's a list of all the mutants and their point values:

Blue Flea	**50**
Red Human Mutant	**150**
Cyan Mashed Potato	**300**
Orange Lion	**400**
Green Mashed Potato	**600**
Yellow Lemonshark	**1000**
Blue Rubberhead	**1000**
Brown Monkey	**1100**
Purple Rubberhead	**1500**



Each type of animal has its own personality. For a closer look at each species, the demo screen lets you bring any animal out into the maze. Use the keys 1–9 to bring out the creatures. For example, press 1 for a blue flea, 2 for a red human mutant, and so on. Hold down the key to bring out several creatures of the same kind.

At the top of the screen is the status area. You'll see your score, your opponent's score (if you have an opponent), the current high score, the number of shields you have (S), and the number of lives remaining (L).

Choose between 1 and 2 players by moving the joystick up or down. When you're ready to begin the battle, press the fire button. The first maze appears. Into the maze, monsters appear, eight at a time. Finally, you (and your opponent, in the two-player game) appear, player 1 in the lower left corner, player 2 in the lower right.

You acquire shields by picking up the whirling, fan-like spars. Shields protect you from being destroyed by shots. You lose a shield each time you are shot. If you're hit without a shield, you lose a life. You'll move on to the next maze when you have collected five spars. You receive 500 bonus points for each shield you have left at the end of the level. Every 10,000 points, you get a new life. You are limited to a maximum of 9 lives and 9 shields at one time.

Move around the maze and shoot the mutants. Note that the mutants also become more powerful when they pick up spars.

You can pause the game by pressing f5. While the game is paused, you can change the color of your player. Press f1 to cycle through and change the color of player 1; press f3 to change player 2.

Warnings And Tips

Be careful when attacking blue or purple rubberheads. If you shoot a rubberhead in the back, your bullet will bounce back and hit you. However, if you keep your distance when firing, you'll be able to shoot the bullets that bounce back until the rubberhead turns toward you. Rubberheads are also dangerous because they shoot special guided missiles that can shoot bullets at you. It's best to destroy these missiles as quickly as possible.

Beware of shooting in hallways that run the entire length of the screen—since shots wrap around from one side of the screen to the other, you may end up shooting yourself. If you fire a few bullets down an unblocked passageway and then quickly get out of the way, the bullets will continue moving until something walks into them. These traps become good defensive strategy.

Your gun has unlimited firepower. Hold down the fire button for continuous firing.

Finally, as each new maze appears, pay close attention to the types of mutants that show up. If one species is over-represented, try not to kill off the enemies of that species—you'll need their help.

See program listing on page 108.

COMPUTE!'s Gazette is looking for utilities, games, applications, educational programs, and tutorial articles. If you've created a program that you think other readers might enjoy or find useful, send it, on tape or disk, to:

Submissions Reviewer
COMPUTE! Publications
P.O. Box 5406
Greensboro, NC 27403

Please enclose an SASE if you wish to have the materials returned.
Articles are reviewed within four weeks of submission.

TEST DIVE ONE FOR YOURSELF.

In their day, they ruled over three quarters of the earth's surface.

During WWII, they viciously brought Britain to her knees. And Japan to the ground.

These were the silent killers: Tench. Gato. U-Boat.

And now, they return. In this, the most realistic, all-encompassing simulation ever created for the personal computer.

You will command one of six types of American subs or German Kriegsmarine U-Boats, during any year from 1939 to 1945. You'll perform one of over 60 missions. Or you'll engage in the most difficult task of all: To make it through *the entire war.*

Each vessel is completely unique and painstakingly authentic, so you'll have a lot to learn: Navigation. Weather. Radar.

And the contents of a vital target book, among other things.

Your arsenal will include deck and anti-aircraft guns. Torpedoes. And mines.

But even all that may not be enough.

Because besides the risk of bumping a depth charge or facing a killer Destroyer, you'll still have to contend with the gunfire of enemy aircraft.

No simulation has ever had the degree of authenticity, gut-wrenching action or historical accuracy of this one.

The first release of our new Masters Collection. And a challenge of unbelievable depth.

EPYX®

Apple II & compatibles, Apple IIGS, Atari ST, C64/128, IBM & compatibles, Macintosh.

TAKE OUR PREVIEW DISK FOR A SPIN. Drop this coupon in the mail with your check or money order, and we'll gladly send you to the South Pacific to have it out with an enemy fleet.

Mail to Sub Battle Preview, P.O. Box 3745, Young America, MN 55394.

	Quantity	Total
Commodore 64/128	_____	$1.50 ea. _____
IBM PC & compat.	_____	$1.50 ea. _____
Atari ST	_____	$2.75 ea. _____
Macintosh	_____	$2.75 ea. _____
Total Disks Ordered	_____	Total Enclosed _____

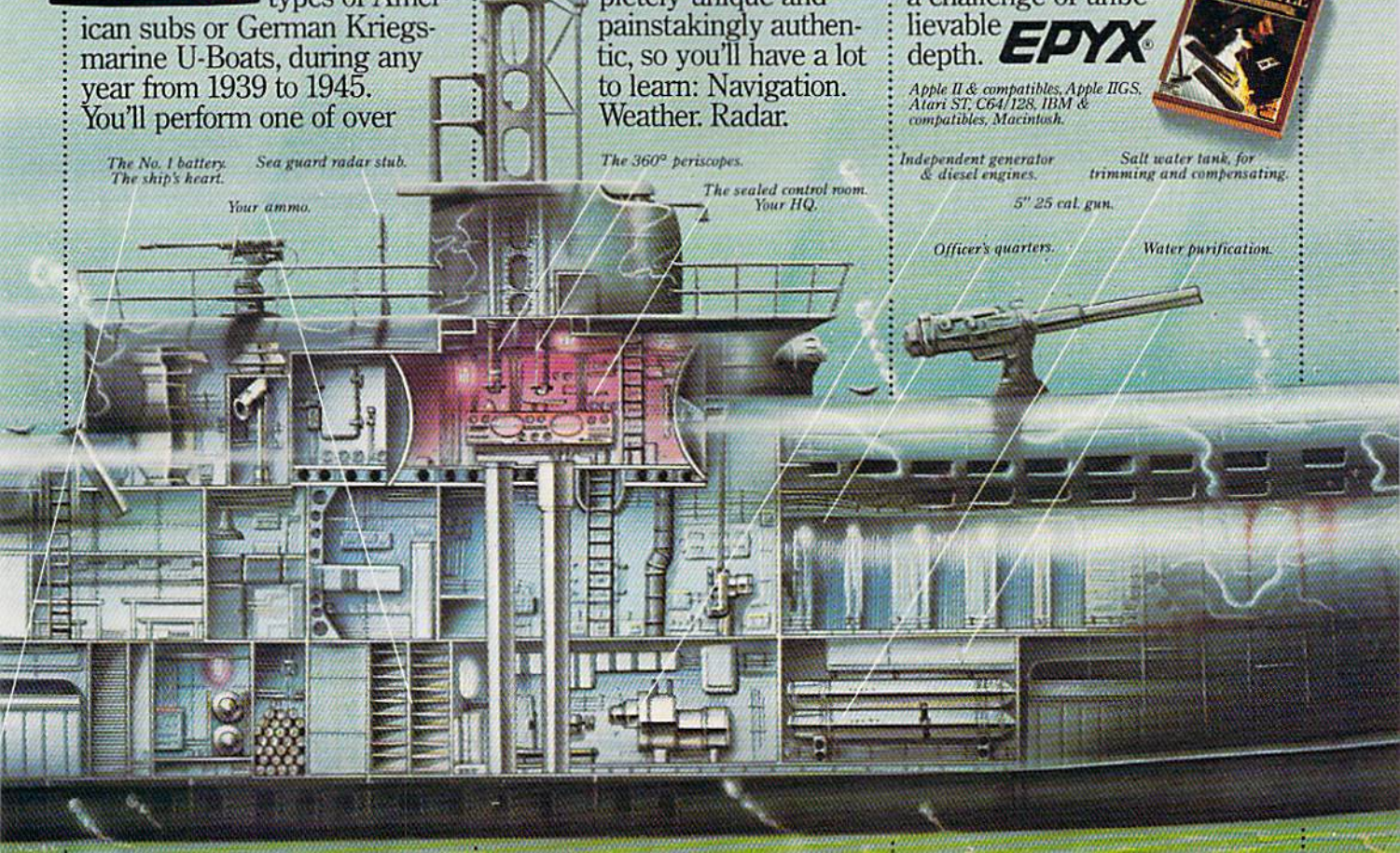
Name _____ Phone ( ) _____

Address _____ Age _____

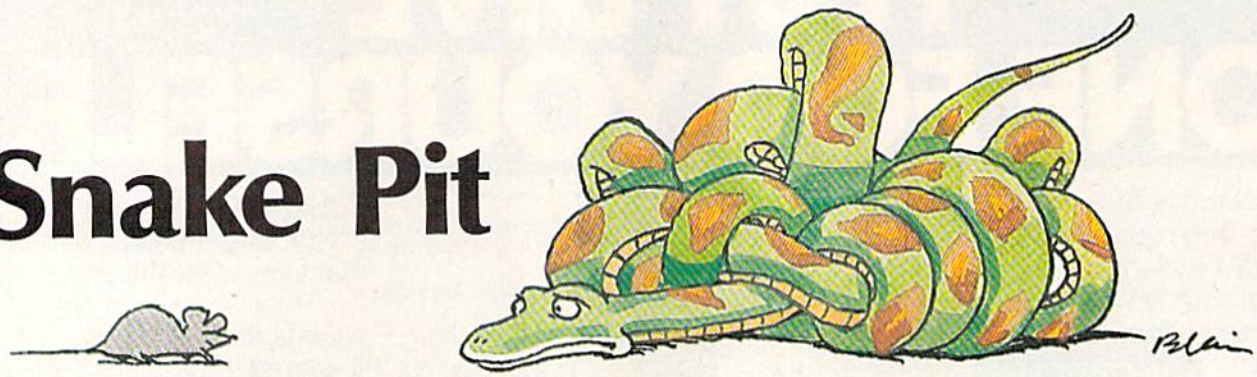
City/State/Zip _____

Canadian orders please add 50¢ for additional postage.

Please allow 4 to 6 weeks for delivery. Offer expires 12/31/88 and is valid only in the continental U.S. and Canada. Void where prohibited.


The No. 1 battery. The ship's heart.
Sea guard radar stub.
Your ammo.
The 360° periscopes.
The sealed control room. Your HQ.
Independent generator & diesel engines.
Salt water tank, for trimming and compensating.
5" 25 cal. gun.
Officer's quarters.
Water purification.

Snake Pit



Michael L. Hall

Like all creatures, snakes have to eat—it's the only way to grow. But in "Snake Pit," growth can be dangerous. A nonstop action game for the 64 that really puts your reptilian reflexes to the test. For one or two players. Joystick(s) required.

"Snake Pit" is a fast-action game for one or two players. As a hungry snake on the move, catching mice is just one of your concerns. As your snake eats, it also grows in length, making it harder to maneuver. And if your snake collides with anything—a wall, your opponent, or even your own slithering tail—it's good riddance to you.

Typing It In

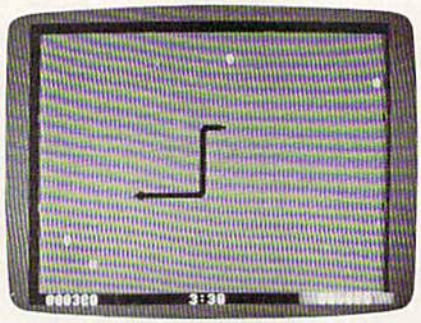
The program is written entirely in machine language so you will need to type it in using "MLX," the machine language entry program found elsewhere in this issue. When MLX asks you for the starting and ending addresses, use the following:

Starting address: C000
Ending address: CB87

When you've finished typing in all the data, save a copy to tape or disk. The game is loaded with a command of the form LOAD "*filename*",8,1 where *filename* is the name you used when saving the program. (Tape users should replace ,8,1 with ,1,1.) To start the game, type SYS 49152 and press RETURN.

Life In The Snake Pit

When the game first begins, a title screen appears and you are asked to choose between a one- or two-player game. Using a joystick plugged into either port, move left or right until the selection of your choice is highlighted in green. Press the fire button to make your selection. Next, you are asked to choose a speed setting. Again, move the joystick left or right until the desired speed is highlighted and press the fire button. Game speed varies between 1 (slow) and 5 (very fast).



One or two players can test their arcade skills in this fast-paced contest.

At the top of the screen, the current score for each player is displayed along with a timer. The game begins with five minutes on the clock. When the timer reaches zero, the game ends. In a two-player game, the player with the highest score wins.

Around the edges of the screen is a blue border with six mouse holes. There are four mice on the screen at all times. Whenever a mouse is eaten by a snake, another mouse enters the pit from a mouse hole.

In the center of the screen lie the snakes—one black and one green. The joystick plugged into port 1 controls the green snake while the joystick plugged into port 2 controls the black snake. In one-player games, only the black snake appears. The score for the black snake appears on the left. The green snake's score is on the right.

To begin the game, each player must move his or her joystick in any direction. At this point, the snakes begin moving and the mice start scampering about. Once a snake has started moving, it cannot stop. Use the joystick to change your snake's direction.

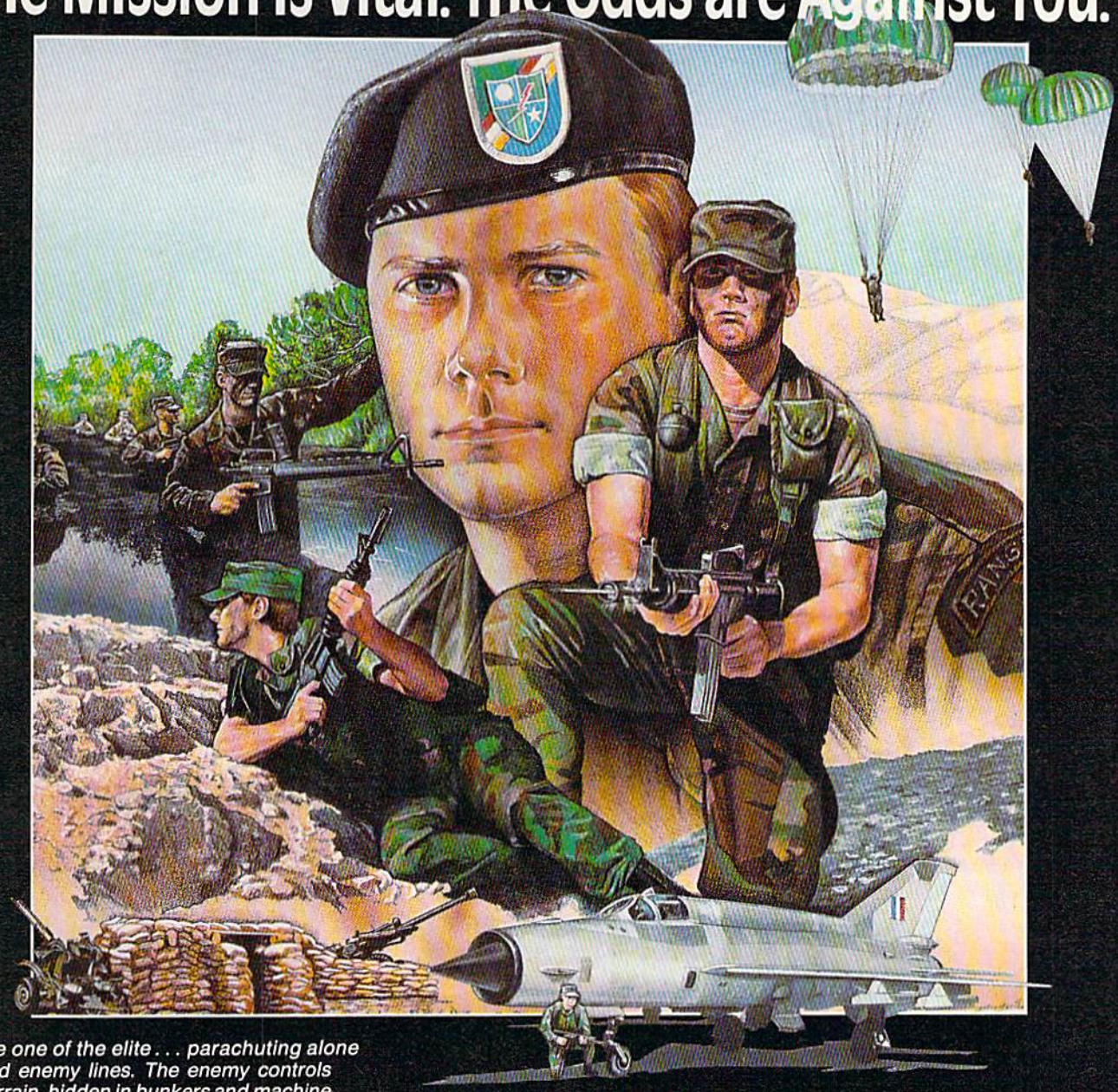
Scoring

There are two ways to score points. First, you get 30 points for each mouse that you catch. (Take note: Whenever a snake eats a mouse, it also grows in length, making the snake harder to maneuver.) Secondly, if your opponent's snake crashes into the sides of the pit, into you, or into himself, that snake turns yellow and dies. When this happens, you get points determined by the length of your opponent's snake; for each unit of length, you gain 20 points. You may attempt to force your opponent into a collision in order to gain points, but be careful not to crash yourself. When a snake crashes, the screen clears after a short delay and a new round begins.

When the timer winds down, a horn sounds and the game ends. To begin a new game, press the fire button.

See program listing on page 107.

The Mission is Vital. The Odds are Against You.



You're one of the elite . . . parachuting alone behind enemy lines. The enemy controls the terrain, hidden in bunkers and machine gun nests . . . you may be surrounded. You might complete the mission if you crawl through the ravine and approach from the rear . . . or maybe a frontal attack will take them by surprise.

MicroProse has broken new ground with **AIRBORNE RANGER**, the quality action game where tactical thinking and lightning reflexes determine your fate. Your missions will vary as much as the climate and terrain. Slip silently into position to rescue prisoners trapped in "tiger pits" from a P.O.W. camp, or throw caution to the wind and try to destroy a key munitions dump in the desert. But watch out . . . enemy troops can attack from any direction.

The action is fierce as you control one soldier's battle against overwhelming odds. You'll need skill and strategy to outmaneuver your enemy, plus courage and some luck to make your escape. Along the way, search out that hidden cache of weapons and first aid supplies . . . you'll probably need them.

AIRBORNE RANGER

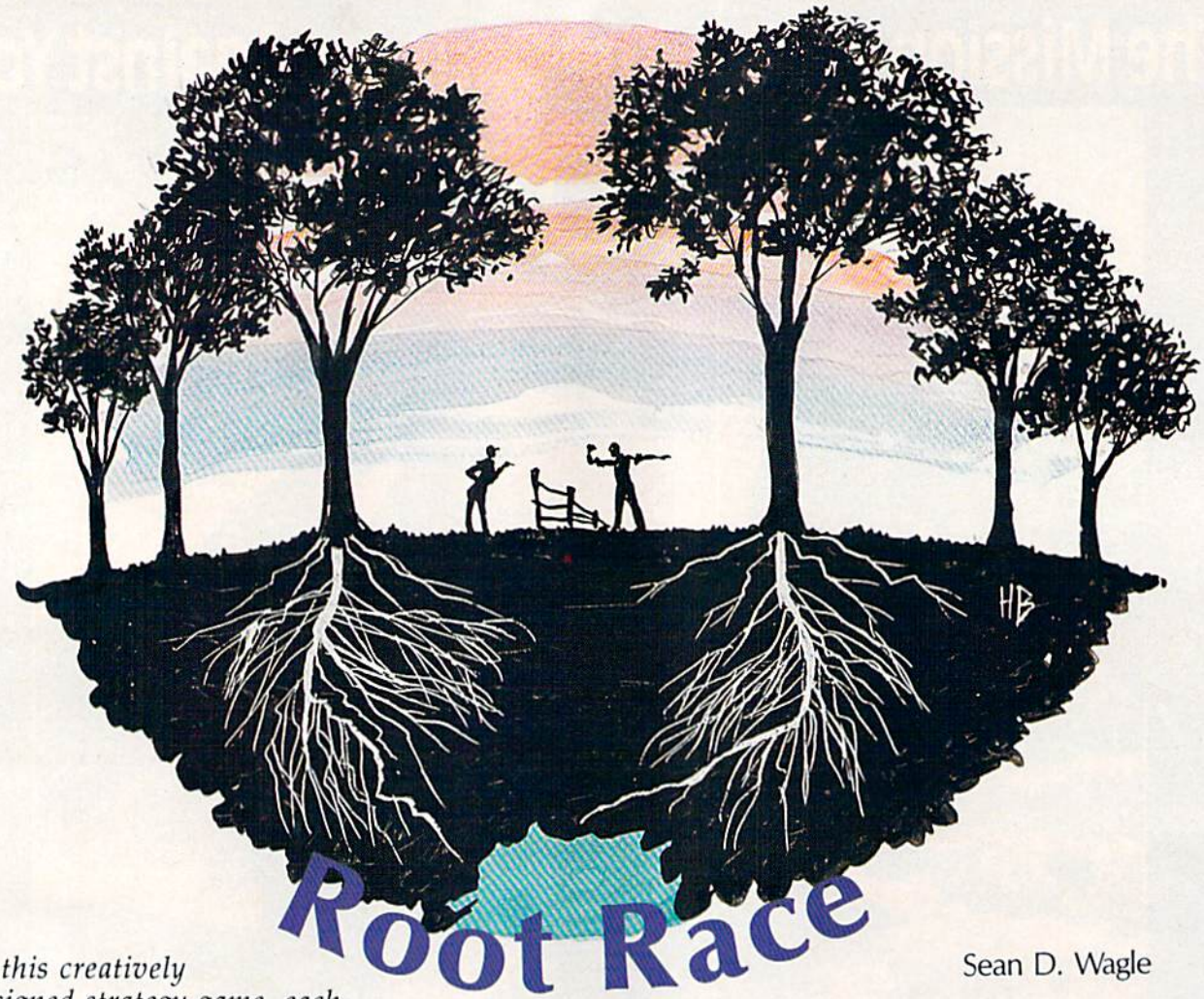
AIRBORNE RANGER is a fast-paced, quick-to-learn game with 12 desperate missions in three different regions of the world. You'll be running, walking and crawling across full-scrolling, 3-D terrain. Arm yourself with an M-16 assault rifle, bayonet, LAW rocket (Light Antitank Weapon) or time bomb, but be wary of enemy submachine guns, antitank rockets, robot minitanks, minefields and flamethrowers.

AIRBORNE RANGER . . . More than just a great game. It's an adventure.

AIRBORNE RANGER is available from a "Valued MicroProse Retailer" (VMR) near you. Call us for locations! For Commodore 64/128, IBM-PC/compatibles and Apple II+/e/c. Call or write for specific machine availability, and for MC/VISA orders if product not found locally.

MICRO PROSE™
SIMULATION • SOFTWARE

180 Lakefront Drive • Hunt Valley, MD 21030 • (301) 771-1151



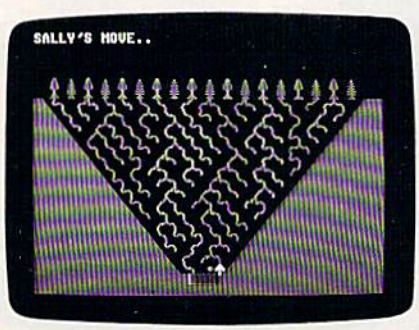
Root Race

Sean D. Wagle

In this creatively designed strategy game, each player controls a group of trees, manipulating the root system in an effort to reach water. The player with the most efficient root system wins. You can play against a friend, the computer, or sit back and watch the computer play against itself. For the 64 with disk drive. Joystick(s) required.

Imagine a stand of trees on a grassy knoll. Two kinds of trees—yours and your opponent's—alternate. Well below the earth's surface is a large pocket of water. The trees' roots move through the earth, toward the water, branching and blocking each other as they grow. Only one tree from each player's group will reach the pool. In "Root Race," you must decide which tree will make it, sacrifice the others, and block your opponent's expansion.

Root Race consists of two BASIC programs: Booter (Program 1) and Root Race (Program 2). Type in and save both programs on the same disk. Because Program 1 looks for the filename Root Race, be sure to save Program 2 with that name. To get started, load Booter and type RUN. Press the space bar when the program is ready and follow the screen prompts. First, Root Race asks whether you want to play with one or two joysticks. Then, select a color for the ground. To make Root Race easy on the eyes, choose a dark color like brown, blue, gray, or black. Next, select the colors for your trees and your opponent's. Now the program will ask how many trees (from three to nine) you want to use. (For beginners, start with three or four trees until you get a feel for the game.) Next, decide whether to play against a friend, the computer, or have the computer demonstrate the game by playing against itself. Last, unless the computer is playing against itself, you'll be asked to enter your name(s)—up to 15 characters per name is allowed.



The final move is about to be made in this game, after which the computer will analyze the size of the competing root systems and announce the winner.

Growing Roots

The program keeps track of whose turn it is to play and starts each player's turn by displaying his or her name on the screen and placing the joystick's pointer under one of the player's trees. Player 1 (in the two-player game, the contestant controlling the joystick plugged into port 1) begins by selecting a tree from which to grow roots. To select the tree, tap the joystick left

BOOT UP AND ROCK OUT.

MAKING MUSIC HAS NEVER BEEN EASIER.

Suddenly, you're a rock star. Screeching, pulsating, throbbing with sound. You're playing music on your computer. There's an invisible band in your bedroom. Your parents don't understand you anymore—and you like it!

What happened? Yesterday you didn't know a treble clef from a tuba. Today you're creating mistake-free music on multiple instruments. You've discovered the revolutionary program with musical intelligence. You've discovered Instant Music.™

CREATE COLOR-CODED COMPOSITIONS.

With Instant Music you can actually see the music you're playing with color bars that appear on your screen. Featuring over a dozen instruments to choose from, you select the ones you want to use. Just move your joystick or mouse to draw in lines of music. It's that simple.

You can compose, too. Instant Music lets you copy and paste, even erase your musical ideas. So improvise and synthesize.

Screen shot represents C64 version.

Experiment with different arrangements or choose from 40 built-in songs—jazz, reggae, even classical.

FROM SOLO EXPRESSIONS TO JAM SESSIONS.

Open your concert with a bass guitar solo. Then rip into a real-time rock out and jam with the interactive band inside your computer. Play up to three instruments at one time. And for really awesome effects, play out through a MIDI keyboard. The sound will blow your socks off!

FREE "IT'S ONLY ROCK'N'ROLL™" DISK INCLUDED

Jam-packed with over 50 rock tunes from the '50s to Now. (Included with C64 version ONLY.)

HOW TO ORDER:

VISIT YOUR RETAILER OR CALL 800-245-4525 FOR DIRECT VISA OR MASTERCARD ORDERS (IN CA CALL 800-562-1112). The Direct Price is $29.95 for the C64 version; Apple IIgs and Amiga versions $49.95. To buy by mail, send check or money order to Electronic Arts, Direct Sales, P.O. Box 7530, San Mateo, CA 94403. Add $3 for shipping and handling ($5 Canadian). There is a 14-day, money-back guarantee on direct orders. Instant Music and It's Only Rock'n'Roll are trademarks of Electronic Arts.

INSTANT MUSIC.
THE POWER TO PLAY.

ELECTRONIC ARTS®

or right until the pointer rests beneath the tree whose roots you want to grow. The pointer will go only where a legal move is possible, so don't worry if it won't move to every tree.

When you've selected a tree, press the fire button and the program will ask, "Which way?" Move the joystick left or right to indicate the direction you want the tree to grow. There are two movement restrictions: You can't move to a location where either you or your opponent has already placed a root, and you can't move to a lower level until your trees have made all the legal moves on their current level. The small gray dots show the levels and the places to which moves are permitted on each level.

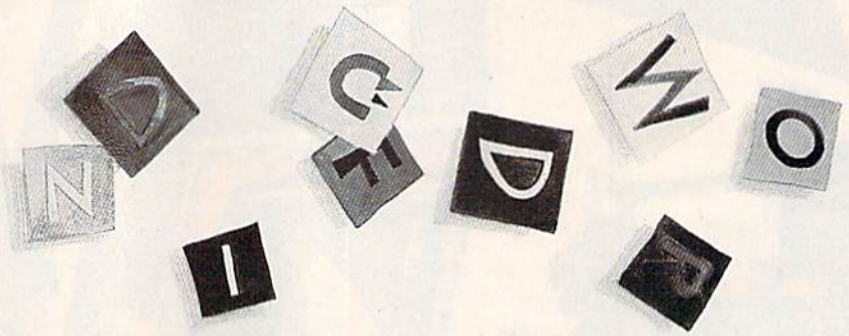
After player 1's turn is over, player 2 can move using his or her own joystick or player 1's joystick. Going first in Root Race is an advantage, so the second player should play carefully. If the game ends in a tie, player 2 has countered player 1's moves successfully and defended very well.

When the game is over, the program offers the option of playing the same game again—using the same colors, number of trees, and player arrangement—or going back to the beginning.

Strategy

To win in Root Race, you need to keep the game's objectives in mind: You must reach the water with a tree that has a longer root system than the other player's. *One* of your trees will make it. You need to be sure it's one with an extensive root system. To expand your root system, you should branch roots whenever possible. The trees in the center have the most room to branch, and the least chance of being cut off, so they are usually able to grow the longest roots *and* make it to the water. But don't ignore the trees on the sides: They can put pressure on the center trees, and occasionally one of them even wins.

See program listings on page 100.



Word Find

Keith Murray

This program is an adaptation of the classic pencil-and-paper word-search game, but with something new: You can specify a time limit and play competitively. For the 128, 64, Plus/4, and 16.

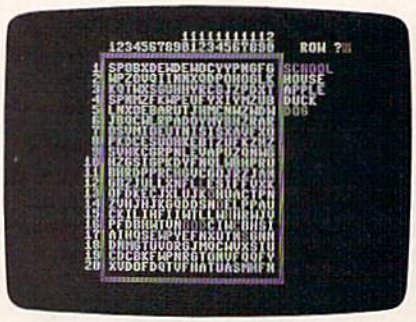
In the traditional version of this game, you're presented with a 20 × 20 grid full of seemingly random letters. The object is to find the words hidden in this maze. The computer version works just like the pencil-and-paper game—but it has the added challenge of being able to specify a time limit for your search.

"Word Find" is written entirely in BASIC. After you've typed it in and saved it, load the program and type RUN. Word Find will ask if you want to use a time limit. If you choose this option, you can select any time period between 1 and 59 minutes. Next, enter the number of words you want to find. You can search for as many as 20 words. Last, type in the words you want to be hidden. Each word can be 3–12 characters long.

Word Hunt

After you've finished selecting the words for your search, the program draws a 20 × 20 grid on the screen, filled with letters. Your words appear to the right of the grid (so you won't forget them). Inside the grid, your words will be placed in almost any position. They might be horizontal, vertical, diagonal, backwards, or forwards.

Now start looking. When you think you've found a word, at the appropriate prompts, type the row and column numbers that correspond to its first letter. If you're right, the program highlights the word you've found in purple. If you're wrong, you're gently notified.



Puzzle buffs will enjoy this computer version of a classic word-search game. In the photo above, the words "dog" and "school" have been located.

After you've found all the words you originally entered, the final screen appears. Press the space bar to play again and any other key to quit. If you choose the time-limit option, you must find all the words in the specified time to win. If time runs out and you haven't found all your words, those remaining are outlined in reverse video and the game ends.

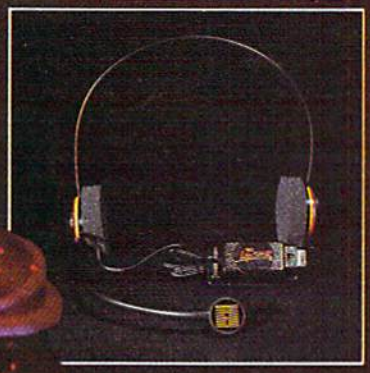
See program listing on page 95.

A NEW STANDARD FOR THE UNIVERSE

. . . NOW AVAILABLE ON EARTH

THE LipStik™ PLUS

VOICE ACTIVATED CONTROL HEADSET



The **LipStik Plus** is a revolutionary idea in game control that adds a new dimension of excitement and realism to joystick operated programs. The **LipStik Plus** is "voice activated" and functions as an extra control button. It does not replace your joystick but is used *with* it to enhance and expand your game playing enjoyment. Just plug your joystick into the **LipStik Plus**. Because it's so simple and doesn't require additional interface software, the **LipStik Plus** works with thousands of existing games. Virtually 95% of all games that use a joystick are compatible with the **LipStik Plus**. It can also be used with most popular home Video Arcade Machines such as the Atari 2600, 5200 and the Sears Arcade Machine.

The **LipStik Plus** adds new life to games you've grown tired of playing. Using the headset gives you a greater feeling of power and control than a joystick alone. The first time you use it with your favorite game you'll know what we mean. You'll find yourself getting more absorbed in the action than you ever thought possible.

Suggested Retail Price:
$24.95 Commodore 64/128/VIC 20/Amiga
Atari Computers 400/800/XL/XE/ST
Atari Game Machines 2600/5200/7800
$29.95 Apple IIE, IIC, IIGS (II & II + w/adapter)
IBM & Compatibles (w/joystick card)

If you can't find our products at your local dealer, you can order direct. For mail orders, enclose check or money order, plus $3.00 shipping and handling, and specify machine version desired. Order by phone on VISA, MasterCard or C.O.D. by calling TOLL FREE (800) 824-2549.
ACCESS SOFTWARE, INC. 2561 So. 1560 W. Woods Cross, UT 84087

ACCESS™
Software Incorporated

Animal Match

David Wright

You're on safari in "Animal Match," a memory game with outstanding graphics and sound for players of all ages. Two skill levels are included. For the Commodore 64.

Children of all ages—and lots of adults—will enjoy "Animal Match," a game formatted like the once-popular TV game show and board game Concentration. It includes an easy version for younger children and a more difficult version for older kids and adults. Animal Match features 18 kinds of animals, ranging from bats to polar bears to zebras.

In the easy version of Animal Match, you simply see which animals pop up when you press various keys. Then you match the animals, pair by pair, until none remain. The more difficult version requires that you match two animals only when a picture of the animal is displayed at the top of the screen.

Getting Started

Animal Match is written in machine language, so you'll need "MLX," the machine language entry program found elsewhere in this issue, to type it in. When MLX prompts you for the starting and ending addresses, respond with the following values:

Starting address: C000
Ending address: CB9F

Be sure to save a copy of the program to disk or tape when you've finished typing.

When you're ready to play the game, load it with a statement of the form LOAD "ANIMAL",8,1. Tape users should use a statement like LOAD "ANIMAL",1,1. When loading, use the filename that you specified when you saved the program.

Match the animals until all the keys disappear. "Animal Match" is an educational game that offers skill levels for all ages.

Type NEW to reset BASIC's pointers and then SYS 49152 to start the game.

You are presented with three options. Press 1 to match the animals on the keys (the easy version). Press 2 to match the animals on the keys with the animal displayed on the screen (the difficult version). Press 3 to exit the program and return to BASIC.

When playing for the first time, choose the first option (press 1). The game begins immediately. At the top of the screen, you'll see a picture of an animal. Below this picture, its name is displayed. After a brief pause, this animal will be replaced by another. After all 18 animals have been displayed, they are recycled in the same sequence. A cycle number appears near the picture, and acts as a timer that will tell you how long (how many cycles) you took to match all the animals.

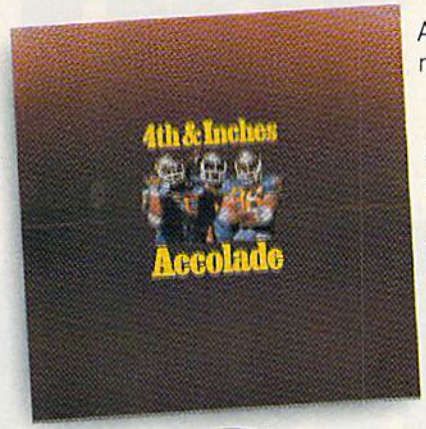
At the bottom of the screen is a graphic representation of the keyboard (letters and numbers only), with each key corresponding to one of the animals. When you press a key, the animal "hiding" beneath the key appears. Press a second key. If the animals match, the keys disappear, and you have one less pair to match. If the animals don't match, both will go back into hiding and you'll have to try another pair of keys.

When the game ends, you go back to the three-option title screen. You can also return to this screen at any time during the game by pressing the f1 key.

To play the more difficult game, select the second option (press 2). In this version, you can remove pairs only by pressing *both* corresponding keys while the animal is being displayed at the top of the screen. For example, if a polar bear is shown, you must press both keys that have polar bears hiding behind them. The animal isn't displayed for long, so you'll have to hurry. This game is difficult; it may take dozens of cycles before you can remove every pair.

If you choose the third option (press 3)—exit to BASIC—you may restart the game by typing SYS 49152.

See program listing on page 105.



Accolade's 4th & Inches puts you in direct contact with some very special friends. Big, fast, mean and ugly friends who would like nothing better than to break your joystick.

When was the last time you needed oxygen to play your computer?

4th & Inches gives you all of the hard-hitting action of real football: the bombs, the blitzing, the goal line stands. You'll experience graphics and animation that are as riveting as a blind side hit.

As the key player on defense, you've got to have speed, stamina and smarts. As the quarterback, you've got to read an unforgiving defense that takes no prisoners. To win, you'll need all the jukes of a #1 draft choice plus the tactical genius of a veteran head coach.

So, now you and your new friends can share all the sportsmanship and comradery of real football playing Accolade's 4th & Inches. And to show there's no hard feelings, they'll even sign your cast. Available for Commodore 64/128.

Accolade. 20813 Stevens Creek Blvd., Cupertino, CA 95014. ACCOLADE

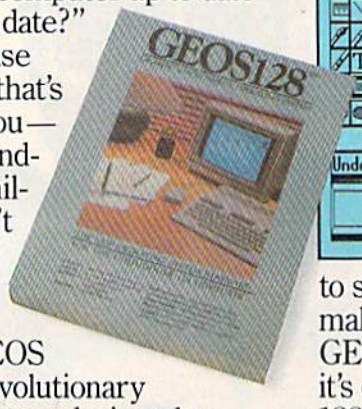
You'll meet some of the nicest people playing 4th & Inches.

IS YOUR 128 OR GROW

So there you are, furiously working away at your Commodore 128, thinking everything is just peachy, when all of a sudden, it hits you. That haunting, hollow, horrible question that every computer owner must inevitably face:

"Is my computer up to date —or out of date?"

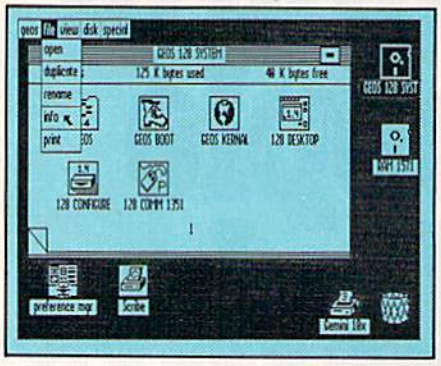
If you use GEOS 128, that's a question you— or your grandchildren's children—won't ever have to worry about.

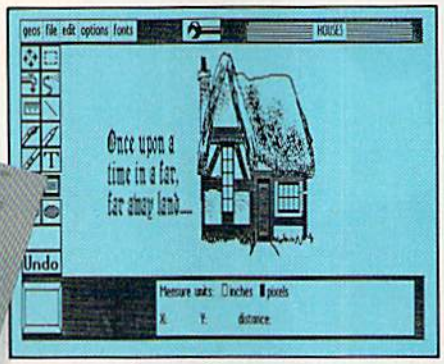


Because GEOS 128 is the revolutionary software system designed to push your hardware to new limits. Unleash its full power across a full 80 column screen. And expand its capabilities for years to come.

We should have installed disk brakes.

Loading up with GEOS turns your 128 into a mouse-driven maniac that loads, processes and saves everything up





to seven times faster than normal. Part of that's due to the GEOS diskTurbo, but most of it's due to the fact that GEOS 128 doesn't treat your 128 like a C64.

You see, by recognizing your machine as a 128, GEOS 128 operates at a full 2 MHz, instead of 1 MHz. So you get twice the speed. Twice the power. And since GEOS 128 also supports the quicker 1571 and 1581 double-sided disk drives— and the 1750 RAM expansion unit—there's no telling how much faster that puppy will fly.

Fast and slick with mouse or stick.

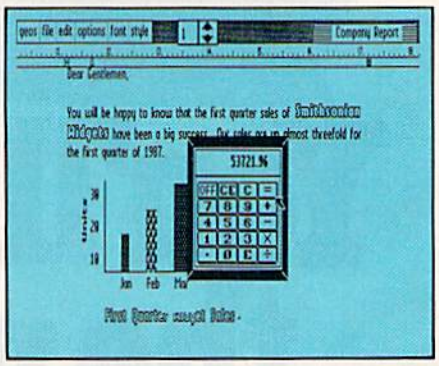
Using GEOS is ridiculously simple. All you need is a mouse or joystick, and a keen ability to point and click. Everything else is pretty much a matter of reading *menus* (a technical term for "little lists of things"), or selecting *icons* (a technical term for "little pictures of things"). It's sort of like talking in sign language.

For example, if you want a document for word-processing, you point to the icon that looks like a stack of papers. Click your mouse and bingo—you're in the file. If you want to erase the file, you drag the stack of papers over to the little waste basket and click your mouse.

Poof. That's about as tough as it gets.

Working within the system.

Learning where things are in GEOS is pretty simple, especially if you've ever sat behind a desk. Because that's exactly how we designed


geos file edit options font style
Company Report
Dear Gentlemen,
You will be happy to know that the first quarter sales of Smithsonian
Widgets have been a big success. Our sales are up almost threefold for
the first quarter of 1987.
$3721.96
Jan
Feb
Mar
First Quarter Sales Data

GEOS 128.

You keep your documents and graphics in files; everything else stays right on the desktop: the notepad, the calculator— there's even an alarm clock. In fact, the only thing our desktop

GROWING UP ING OLD?

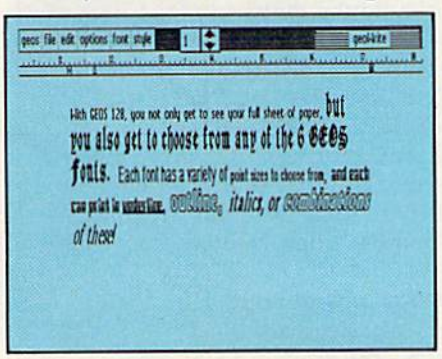
Now, we realize that's a lot to pack into one GEOS package. But as long as we're packing it in, we might as well let you know something else: There's more.

doesn't have is a place to put your feet when the boss isn't around.

But not only does GEOS give you a place to write and draw, it actually helps you write and draw better. Because unlike your basic office model, our desktop comes with geoWrite and geoPaint built right in.

With geoWrite, your way with words leaves people speechless, as they watch you effortlessly cut, paste and move entire blocks of copy anywhere on the page. And since geoWrite comes with different fonts in a variety of styles and sizes, your documents become even more dazzling.

With geoPaint, you can draw designs. Create with colors. And tantalize your tastes with tons of tones and textures. Invert, rotate or mirror images.


With GEOS 128, you not only get to see your full sheet of paper, but you also get to choose from any of the 6 geos fonts. Each font has a variety of point sizes to choose from, and each can print in underline, outline, italics, or combination of these!

Then place them wherever you want: either in your geoWrite document, or in your GEOS Photo Album for later use.

But no matter what kind of masterpiece you create, you always get to view it on a beautiful, 80 column-wide screen. No more scrolling left to right. With GEOS 128, what you see really is what you get.

The more you put into your system, the more you get out of it.

Of course, when we say that GEOS 128 has far-reaching implications, we're not kidding around. Every GEOS 128 package includes free QuantumLink software, which hooks you (via modem) into a nationwide network of Commodore people just like you. There's even a service that will Laserprint your documents for you.

The older it gets the better it looks.

It's true. Because there are always new GEOS applications just waiting to jump off the shelves and into your 128. Packages like geoDex and geoFile, for keeping addresses and data straight. Fontpack and Writer's Workshop, for tweaking text with that special, extra touch. And, of course, geoCalc, a full-featured graphics spreadsheet for all you number freaks.

They're just the first in a long line of GEOS applications that are constantly being developed to keep your 128 up to date.

So if you'd rather have your 128 grow up than grow old, load up with GEOS. You owe it to yourself. You owe it to your 128.

Heck, you owe it to your grandchildren.

To order call 1-800-443-0100 ext. 234

GEOS 128 $69.95

(California residents add 7% sales tax.)

$2.50 US/$5.50 Foreign for shipping and handling. Allow six weeks for delivery.

Commodore, Commodore 128 and C64 are trademarks of Commodore Electronics, Ltd. GEOS, GEOS 128 and Berkeley Softworks are tradenames of Berkeley Softworks.

GEOS 128

Berkeley Softworks

The brightest minds are working at Berkeley.

the geos column

More On Strings

John Howard

"One note of caution about the Waste Basket: It is actually an incinerator—any files dropped into it cannot be recovered." So states the GEOS *user's manual, in reference to the deskTop Waste Basket. Here's a program that allows you to rescue disk files from the* GEOS *incinerator. "GeoTrash Restorer" pulls deleted files from the Waste Basket and places them back on top of the deskTop.*

Have you ever crumpled up a piece of paper, tossed it in the waste basket, and then, realizing that it was something important, pulled it back out? The same thing can happen with disk files while using the *GEOS* deskTop—only you can't pull anything out of this waste basket. Unlike the Amiga's Trashcan directory or the Macintosh's Trash icon, files placed into *GEOS*'s Waste Basket are deleted immediately.

Fortunately, Commodore DOS does not actually erase deleted files from a disk. And as long as you have not saved or rearranged any files since dragging something into the Waste Basket, you may recover the deleted file. "GeoTrash Restorer" takes advantage of this fact, allowing you to sift through the deskTop Waste Basket—without even getting your hands dirty—and restore any documents you have inadvertently thrown away.

Typing It In

GeoTrash Restorer is written in BASIC. Because this program writes directly to your disk directory, it requires accurate typing, so be sure to enter the program using the "Automatic Proofreader," found elsewhere in this issue. If you wish to run GeoTrash Restorer from the deskTop, be sure to save a copy to a *GEOS* work disk.

Retrieving Files From The Waste Basket

To retrieve a file from the deskTop Waste Basket, run GeoTrash Restorer. If you saved GeoTrash Restorer to a *GEOS* work disk, you can run the program by double-clicking GeoTrash Restorer's icon. Otherwise, you must load and run the program from BASIC. To exit *GEOS*, select the BASIC option found in the Special menu.

When the program instructs you, place the *GEOS* work disk containing the deleted file into drive 8 and press RETURN. GeoTrash Restorer searches the disk, looking for files that have been thrown away.

Every time GeoTrash Restorer finds a deleted file, it asks you if you want to restore it, and if so, to indicate the file type. *GEOS* files are almost always USeR files (type 3). The only other types of *GEOS* files to date are GEOS, GEOS BOOT, BACKUP, and DISK COPY, which are all PRoGram files (type 2). So, to restore a *GeoWrite* file, for example, enter a 3 for USR. If you do not want to restore the specified file, simply enter a 0. GeoTrash Restorer can even be used to restore deleted files on your other Commodore disks. Two other file types are available on Commodore disks besides the USR and PRG files used by *GEOS*. These are SEQuential files (type 1) and RELative files (type 4). You may need to restore SEQ or REL files if you are working on your other Commodore disks.

When GeoTrash Restorer finishes, you are instructed to boot *GEOS* and validate the disk. Never use the normal Commodore validate command on your *GEOS* disks; use the validate command available from the Disk menu on *GEOS*'s deskTop. After validating the disk, you should be able to use the restored files just as if they'd never been tossed in the Waste Basket.

See program listing on page 95.

GeoConverter Fix

Douglas S. Curtis

Since *GEOS* uses a unique format for its files, *GEOS* applications must be converted if they are written using a standard 64 assembler. The need for such a converter will disappear when a true *GEOS* assembler is released, but until then, conversion is an unfortunate necessity.

In the October issue, "The *GEOS* Column" published the program "GeoConverter," a utility that converts standard machine language program files to *GEOS* files. This program works similarly to the PRGTOGEOS program in Berkeley Softworks' *The Official Programmer's Reference Guide*. As stated in that article, both GeoConverter and the PRTTOGEOS program occasionally create files that give a system error when run. We now know why.

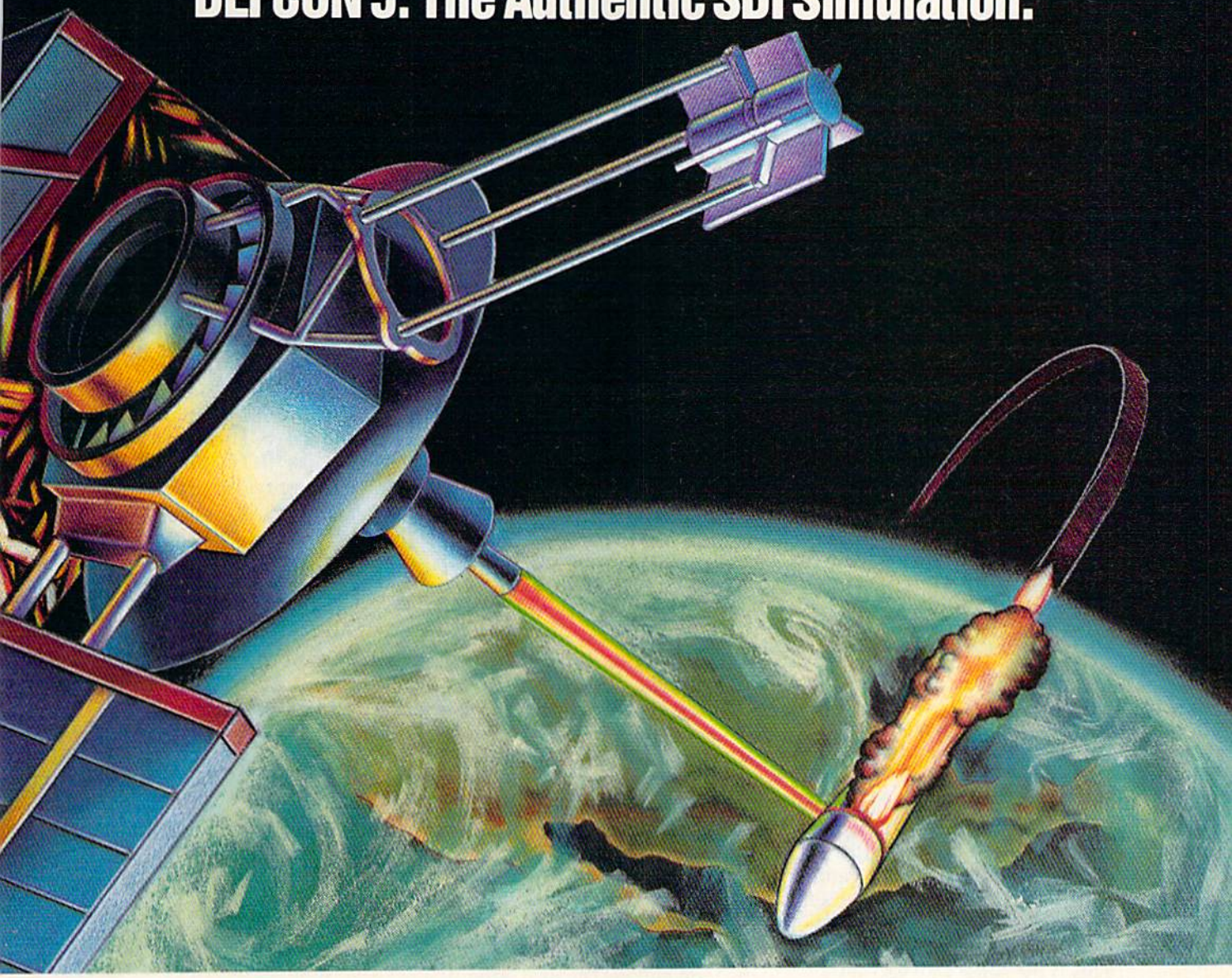
Both converter programs fail when the file being converted is stored on disk with a starting sector number of 0. To read the starting track and sector number of a file, GeoConverter and PRGTOGEOS use BASIC's GET command. Unfortunately, when the 64 GETs a value of 0 from disk (that is, sector 0), BASIC returns a null string, not a CHR$(0). Now, when the starting sector number is written back to disk, a null string *(nothing)* is output to the disk. Without the proper sector number, the resultant file bombs when booted from the deskTop.

To fix GeoConverter, change the following lines:

```
170 GET#2,HT$,HS$:I=3:IF HS$="" THENHS$=CHR$(0)
280 GET#2,MT$,MS$:IF MS$="" THENMS$=CHR$(0)
```

SAVING THE HUMAN RACE CAN BE VERY ENTERTAINING.

DEFCON 5: The Authentic SDI Simulation.



ENEMY LAUNCH DETECTED ALPHA ZULU 13:43.
EXPECT VIOLATION U.S. AIRSPACE 14:09.

YOU are at the controls of America's "Star Wars" space-based missile defense system. DEFCON 5 is an authentic simulation of our Strategic Defense Initiative.

Your computer is in command of a network of orbiting visual reconnaissance satellites and an awesome arsenal of sophisticated space-based weapons. The fate of the world is in your hands. You make the split-second decisions necessary to detect, intercept and destroy incoming enemy warheads.

Using realistic military commands you control 9 separate weapon systems, including orbiting lasers, neutral particle beam emitters, electro-magnetic launchers, and nuclear-pulsed x-rays. We're at Defcon 5 and counting. Impact is imminent. Will you destroy the missiles in time to save the human race?

Call TOLL-FREE for the COSMI dealer nearest you, or to order direct.

DEFCON 5 is by Paul Norman, creator of the Super Huey flight simulator series.

DEFCON 5 for C-64/128 is priced at $19.95. For IBM PC, $24.95.

COSMI

(800) 843-0537
In California (800) 654-8829
415 N. Figueroa Street
Wilmington, CA 90744

Richard Mansfield
Editorial Director

When people first learn BASIC (or any other new language), the first thing they want to do is put "hello" or some other message on the screen. This gets you in touch with the computer and teaches you several things about the new language. It's also a demonstration that things are working, since viewing things on the screen is one of the best debugging tools there is.

Printing's easy, of course, in BASIC:

```
10 PRINT "HELLO"
```

In machine language there are three primary ways to print strings. All three methods require a loop because you print your message one character at a time:

```
10 *= 870; 4864 for the 128
15 SCREEN = 1024
20 LDY #0
30 LOOP LDA MESSAGE,Y: STA
   SCREEN,Y
40 INY: CPY #5: BNE LOOP
50 RTS
100 MESSAGE .BYTE "HELLO"
```

Line 10 tells your assembler to store this program at address 870, which is a safe area to use in the 64. (If you are a 128 user, use 4864.) The value 1024 (the start of Commodore 64 and 128 screen memory) is assigned to the label SCREEN in line 15. This is the same way you assign a value to a constant in BASIC.

Variables vs. Constants

Let's digress a moment to distinguish between constants and variables. Although they can be used interchangeably in BASIC, you'll need to know the difference when programming in ML. When you use labels in ML, such as SCREEN and MESSAGE as seen above, they cannot be changed while the program is running. They are *constants*; in this case they're addresses within RAM. A *variable*, though, is going to vary while the program executes. It might be the score of a game or anything else that will change. Variables in ML are simply bytes of RAM set aside to hold values:

```
SCORE .BYTE 0
```

This looks like our MESSAGE above, but it's just a blank we arbitrarily set aside. When the program runs, we'll reference this byte however we wish. It can be changed any time the program wants to update it (just like a BASIC variable). To raise the score by one

```
INC SCORE
```

and the byte goes up one in value. If, however, you tried to INC MESSAGE, you would change the *H* to an *I*, and INC SCREEN would increment the character in the upper left of the screen.

But back to strings, the matter at hand. Line 20 sets the Y register to zero so it can pick off each letter in the message, starting with the zero letter, *H*, and working up via the INY in line 40. In line 30, we load a character from the address of label MESSAGE *plus* the value of Y (which keeps going up during this loop). We then store it at the address of the screen, plus Y.

In line 40 we CPY (ComPare Y) to 5 to see if we've picked off all five letters. If we haven't, we BNE (Branch if Not Equal to zero) back to the loop and get the next letter. If Y *has* reached 5, we RTS (ReTurn from Subroutine) back to BASIC.

Zero-Delimited Strings

Line 100 uses the label MESSAGE to identify the address where the message will be assembled into RAM memory. The .BYTE command tells the assembler to read the characters between the quotation marks and place them in RAM.

There's another way to print strings. Just insert a zero at the end of the message, and, when that zero is detected within the loop, you know you're done:

```
10 *= 870; 4864 for the 128
15 SCREEN = 1024
20 LDY #0
30 LOOP LDA MESSAGE,Y
40 BEQ DONE; IF ZERO, BRANCH OUT
   OF LOOP
50 STA SCREEN,Y
60 INY: JMP LOOP
70 DONE RTS
100 MESSAGE .BYTE "HELLO"
110 .BYTE 0
```

Here we LDA MESSAGE,Y and the zero will eventually trigger the BEQ in line 40, exiting from the loop. We add the zero to the end of the message in line 110. Finding no quotation marks after .BYTE, the assembler stores numbers rather than characters. By the way, anything following the semicolon is ignored by the assembler to allow you to comment your programs. See lines 10 and 40.

The third way to print strings involves JSRing to the PRINT routine within BASIC:

```
10 *= 870; 4864 for the 128
15 PRINT = $FFD2
20 LDY #0
30 LOOP LDA MESSAGE,Y
40 BEQ DONE
50 JSR PRINT
60 INY: JMP LOOP
70 DONE RTS
100 MESSAGE .BYTE "HELLO"
110 .BYTE 0
```

Here, the only differences from the previous examples involve defining the start address of BASIC's PRINT routine (line 15) and going to that subroutine in line 50 after we've picked up the character we want to print. The PRINT subroutine also keeps track of the cursor location and prints each new character in the proper place. These examples are designed to run on the 64 or 128 (in 40-column mode). Be sure before you SYS 870 (SYS 4864 for the 128) that your screen is displaying lowercase characters.

Out of the Arcade and Into Your Computer!

KARATE CHAMP™*—Put on your black belt and challenge your friends or the computer. For Commodore 64/128™ and Apple II® series.

KUNG-FU MASTER™*—Battle the evil forces to rescue the captive fair maiden. For Commodore 64/128™ and Apple II® series.

TAG TEAM WRESTLING™—Battle your way through the Title Matches on your quest for the belt. For Commodore 64/128,™ Apple II® series, and IBM.

COMMANDO™*—As the crack shot Commando, battle overwhelming odds to reach the fortress. For Commodore 64/128,™ Apple II® series, and IBM.

EXPRESS RAIDER™—Bandits have seized the Gold City Express. Rescue the passengers, save the train, and recapture the loot! For Commodore 64/128.™

BREAKTHRU™—Your mission is to retrieve the secret fighter plane stolen by renegades. For Commodore 64/128.™

VICTORY ROAD™*—Our heroes from *Ikari Warriors*™ are back to battle the most fearsome enemies of all. For Apple II® series, IBM, and Commodore 64/128.™

IKARI WARRIORS™*—You and your partner are engaged in guerilla warfare as you battle your way through jungles, rivers, and ruins. For Commodore 64/128,™ Apple II® series, and IBM.

KID NIKI, RADICAL NINJA™*—This "rad" and "bad" punk dude is out to rescue his spike-haired girlfriend from the clutches of the Stone Wizard! For Apple II® series and Commodore 64/128.™

SPEED BUGGY™*—Conquer a variety of courses by running into flags, jumping over obstacles, and driving on two wheels to gain time and bonus points. For Commodore 64/128™ and Atari ST.™

DATA EAST USA, INC.
470 Needles Drive, San Jose, California
95112. (408) 286-7074.

DATA EAST®

© 1987 DATA EAST USA, INC. * KUNG-FU MASTER, COMMANDO, VICTORY ROAD, IKARI WARRIORS, KID NIKI, AND SPEED BUGGY ARE MFD. UNDER LICENSE FROM IREM CORP., AND TATSUMI, RESPECTIVELY. CORP., SNK CORP., IREM CORP., AND CAPCOM USA, SNK COMMODORE, APPLE, IBM, AND ATARI ARE REGISTERED TRADEMARKS OF COMMODORE ELECTRONICS LTD., APPLE COMPUTERS, INC., IBM CORP., AND ATARI CORP., RESPECTIVELY.

simple answers to common questions

Tom R. Halfhill, Staff Editor

Each month, COMPUTE!'s Gazette tackles some questions commonly asked by Commodore users. If you have a question you'd like to see answered here, send it to this column, c/o COMPUTE!'s Gazette, P.O. Box 5406, Greensboro, NC 27403.

Q. In the September "Simple Answers to Common Questions," there was a letter from a reader who had accidentally formatted a disk. You responded that the only way to recover the lost data was to rebuild the directory using a disk sector editor, provided that a short format had been used. But in the July 1986 "Gazette Feedback" column, there was an item entitled "Recovering from a Short Format." This item offered a short program that would rebuild the directory as long as the disk had been formatted without an ID.

Michael Hocter

A. Right you are. This isn't the first time a sharp-eyed reader has pointed out a solution to a problem that already appeared in a past issue, and it probably won't be the last. Maybe someday when the entire archive of COMPUTE!'s Gazette (going back to 1983) is on CD-ROM, we'll be able to search for things like this in a matter of seconds.

The program you mention is reprinted below. Before anyone attempts to run it, however, observe a few warnings. First, it works only on disks which have been "short formatted"—that is, formatted without an ID number, as described in the September column. Second, it restores all but the first eight programs on the disk, although sometimes it may restore the first program. If it does restore the first program, the restored file appears on the directory under the filename ZZ. Finally, the restored disk still doesn't win a clean bill of health. Immediately copy any files you can to another disk, then completely reformat the first disk before using it again.

```
10 FORA=1TO10:READB:A$=A$+CHR$
   (B):NEXTA:FORA=1TO14:A$=A$+
   CHR$(160):NEXTA
20 DATA 0,3,21,18,4,130,17,0,9
   0,90
30 OPEN1,8,15:OPEN2,8,2,"#0"
40 PRINT#1,"U1 2 0 18 1"
50 PRINT#1,"M-W"A$
60 PRINT#1,"U2 2 0 18 1"
70 CLOSE2:CLOSE1
```

Q. Do you know of any Commodore software for the collection and storage of genealogical information?

A. In a book entitled *I Didn't Know You Could Do* That *With A Computer!* (COMPUTE! Books, 1986), author Dan Gutman cites *Family Roots*, a program published by Quinsept, P.O. Box 216, Lexington, MA 02173. Although we've not seen this program, Gutman states that it's intended for those with a serious interest in the subject. It's almost certain that there are other genealogical packages among the thousands of programs available for Commodore computers.

We receive a great many letters from readers who want us to recommend specific software packages designed for a specialized purpose. We can rarely respond to these requests, since we usually haven't used the software. It's worthwhile to remember, however, that when you can't find a program for a specialized application, there's a great deal of general-purpose software on the market that's capable of tackling almost any task. For instance, if you can't find a program designed specifically for storing genealogical information, you could consider using any good, general-purpose database program. When you think about it, a genealogical database has a lot in common with an ordinary address book—it's just more detailed.

You can even press a word processor into service as a competent information organizer. The advantage here is that a word processor doesn't restrict you to a rigid record format, as some database programs do. Just enter your data as if you were writing a letter, perhaps making each "record" a separate paragraph. Any good word processor has a high-speed search function that can locate a certain string of characters in a split second. This makes it easy to locate a specific record in a large file without scrolling through the text and searching for it yourself.

For instance, if you need to look up the birth and death dates of an ancestor whose name is John Jones, simply search for *John Jones* or for any other string of characters which you suspect is unique to his record (such as his hometown, his wife's maiden name, or the name of an offspring). You could even begin each record with a special code that indicates that person's position in your family tree, then use the code as a basis for searches.

If your text file grows too large, you can split it into separate files, perhaps one for each branch of the family. You can also use the word processor's printing features to make copies of the file for relatives.

The Commodore Connection

COMMODORE COMPUTERS

AMIGA 500 SYSTEM

Includes: A500, 1 Meg, A1080 Monitor, Mouse, Amiga DOS, Kaleidoscope $1099

COMMODORE 64 SYSTEM

Includes: CB64C Computer, CB1541C Disk Drive, CB1802 Monitor 599.00
128 System Package w/2002/1571 ..... 759.00
CBM128 Mouse 34.99
CBM128 512K Memory Expansion 169.00
C64 256K Expansion 149.00
C64 Power Supply 29.99
Amiga 1 MB Board/0K 249.00
Amiga Genlock Interface 239.00
Amiga Sidecar 799.00

ACCESSORIES

Curtis Emerald - 6 outlet 62.99
Curtis Universal Printer Stand 17.99
Computer Specialties Power Plus 54.99
CB128 Universal Monitor Cable 16.99

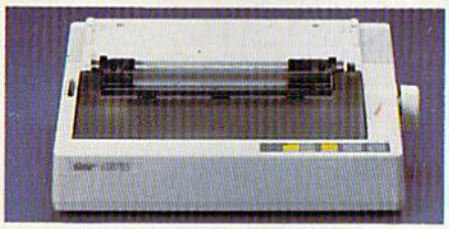
MONITORS

AMIGA
1080 Hi-Res Color 299.00
COMMODORE
Commodore 1802 ..... 199.00
Commodore 2002 ..... 289.00
MAGNAVOX
8502 13" Composite Color 179.00
8562 13" Composite/RGB 279.00
8CM515 14" Composite/RGB 289.00
Thomson
4120 14" RGB/Composite 259.00
ZENITH
ZVM 1220/1230 ..... (ea.) 99.99

MODEMS

ANCHOR
Volksmodem 12 300/1200 ..... 99.99
6480 300-1200 Baud for 64/128 ..... 109.00
Omiga 80 300-1200 Baud for Amiga 119.00
HAYES
Smartmodem 300 ..... 139.00
Smartmodem 1200 ..... 319.00
COMMODORE
Amiga 1680-1200 BPS 119.00
CBM 1660 (C-64) 49.99
CBM 1670 (C-128) ..... Call
NOVATION
Parrot 1200 ..... 119.00
PRACTICAL PERIPHERALS
1200 BPS External 159.00

PRINTERS



Star Micronics NX-10C 120 cps 30 NLQ Dot Matrix Printer $189

EPSON
FX-86E 240 cps 80 Col ..... Call
FX-286E 240 cps 132 Col ..... Call
EX-800 300 cps, 80 Col ..... Call
LQ-1000 24 wire, 132 Col 599.00
Hi-80 4 Pen Plotter ..... Call
BROTHER
M-1109 100 cps, 9 Pin 199.00
HR-40 40 cps Daisywheel 599.00
HEWLETT PACKARD
Think Jet 369.00
OKIDATA
Okimate 20 Color Printer 129.00
ML-182 120 cps Dot Matrix 229.00
ML-192+ 200 cps Dot Matrix 329.00
ML-292 200 cps 80 Col 399.00
STAR MICRONICS
NX-10C 120 cps Dot Matrix 189.00
NX-15 120 cps, 132 Col 339.00
TOSHIBA
P321SL 24 Wire 80 column 539.00
P351C 24 Pin Color 1099.00

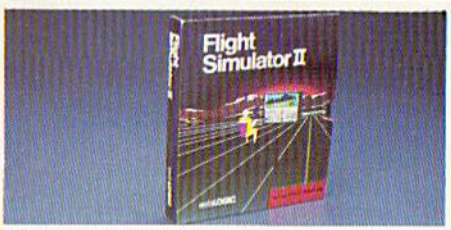
DRIVES

COMMODORE
1581 3½" Ext 229.00
Amiga 2010 3½" Internal ..... Call
Amiga 1010 3½" 219.00
Amiga 1020 5¼" 189.00
1541C 169.00
1571 ..... 229.00
SUPRA
20 mb (Amiga) 759.00
XEBEC
20 mb (Amiga) 9720H 849.00

DISKETTES

ALLSOP
Disk File 30 (3½") 9.99
Disk File 60 (5¼") 9.99
MAXELL
MD1-M SS/DD 5¼" 8.49
MD2-DM DS/DD 5¼" 9.49
MF1-DDM 3½" SS/DD 12.49
MF2-DDM 3½" DS/DD 18.49
SONY
MD2D DS/DD 5¼" 9.49
MFD-IDD 3½" SS/DD 12.99
MFD-2DD 3½" DS/DD 19.99

AMIGA SOFTWARE



SUBLOGIC Flight Simulator II $34.99

AEGIS DEVELOPMENT
Animator/Images 83.99
Draw Plus 149.00
COMMODORE
Textcraft w/Graphic Craft 59.99
Assembler 79.99
Enhancer DOS 1.2 ..... 14.99
DISCOVERY SOFTWARE
Marauder Back-up 26.99
Grabbit 23.99
ELECTRONIC ARTS
Deluxe Paint II 97.99
Seven Cities of Gold 31.99
Arctic Fox 31.99
Deluxe Print 74.99
Instant Music 34.99
Deluxe Video Version 1.2 ..... 97.99
INFOCOM
Hitchhiker's Guide 28.99
MICRO ILLUSIONS
Dynamic-Cad 329.00
MINDSCAPE
Halley Project 31.99
MICRO SYSTEMS
Analyze Version 2.0 ..... 119.00
Scribble 64.99
On-Line/Comm 46.99
Organize 64.99
NEW TEK INC.
Digi-View 159.00
V.I.P.
V.I.P. Professional 112.00

C64/128 SOFTWARE

COMMODORE
Jane-integrated (128) 39.99
Geos for 64, 64C, 128 ..... 42.99
BRODERBUND
The Print Shop 29.99
Graphics Library 1,2,3 ..... (ea.) 17.99
The Toy Shop 39.99
Print Shop Companion 24.99
PROFESSIONAL SOFTWARE
Fleet Systems II C128/64 ..... 49.99
Fleet Systems III C128 ..... 49.99
Spell Right 4.99
PFS
File 29.99
SUBLOGIC
Flight Simulator 37.99
Jet Simulator C64 ..... 37.99

COMPUTER MAIL ORDER

In the U.S.A. and Canada

Call toll-free 1-800-233-8950

Outside the U.S.A. 717-327-9575 Telex 5106017898 Fax 717-327-1217
Corporate and Educational Institutions call toll-free: 1-800-221-4283
CMO. 477 East Third Street, Dept. A412, Williamsport, PA 17701
All major credit cards accepted.

POLICY: Add 3%, minimum $7.00 shipping and handling. Larger shipments may require additional charges. Personal & company checks require 3 weeks clearance. For faster delivery use your credit card or send cashier's check or bank money order. PA residents add 6% sales tax. Defective software will be replaced with same item only. All items subject to availability and price change. All sales final, returned shipments are subject to restocking fee.

Working With Strings

Larry Cotton

This month, we'll look at the three string-related functions: LEN, VAL, and STR$.

The Length (LEN) Function

The LEN function is very useful when dealing with strings. Enter the following program for an example:

```
AX 10 INPUT"YOUR FIRST AND LAS
      T NAMES";N$
RS 20 L=LEN(N$)
FS 30 PRINT:PRINT"YOUR NAME IS
      "L"CHARACTERS LONG."
```

As you will notice, LEN counts the number of characters in a string. In line 20, the variable L becomes the LENgth of N$, the name entered. Note that LEN counts *all* characters—even the space between names.

What if you don't want to count spaces? One way is to use a FOR-NEXT loop in conjunction with MID$ to scan the string. Substitute line 30 and add lines 40–70 to the above program:

```
MK 30 FOR T=1 TO LEN(N$)
AE 40 M$=MID$(N$,T,1)
RA 50 IF M$=" " THEN L=L-1
GJ 60 NEXT
EP 70 PRINT:PRINT"YOUR NAME IS
      "L"LETTERS LONG."
```

You should look at this program carefully; it's somewhat tricky. In line 30, we use LEN(N$) as the upper limit in a FOR-NEXT loop. Line 40 uses the MID$ function to examine each character of your name. If the character currently under scrutiny (M$) is a space, line 50 subtracts 1 from the variable L. By the end of the FOR-NEXT loop, L is equal to the length of N$, minus any spaces.

Another practical use for LEN is to validate information after it is entered. Here's how:

```
EG 10 PRINT"{HOME}"
XA 20 INPUT"A FIVE LETTER WORD
        IS";W$
QM 30 IF LEN(W$)<>5 THEN PRINT
      "THAT'S NOT FIVE LETTERS
      .":GOTO 10
FK 40 PRINT"NOW THAT'S FIVE LE
      TTERS LONG."
```

Line 30 simply checks to see if the length of the string entered is 5. If not, a message is printed and the question is repeated. If the IF-THEN statement proves false (W$ is five characters long), the program falls through to line 40, where it continues.

Notice that GOTO 10 must be on the same line as the IF-THEN statement. If it were on the next line, the program would GOTO 10 regardless of the length of W$.

As you might expect, LEN is not limited to variables. For example, entering **PRINT LEN("GAZETTE")** causes a 7—the number of characters in "GAZETTE"—to print to the screen.

Converting Between Strings And Numbers

The next two functions we'll look at are VAL and STR$. In simplest terms, VAL converts a string into a number, and STR$ converts a number into a string.

Here's an example of how to use the VAL function in association with GET to input a number from the user:

```
AS 10 PRINT"ENTER A NUMBER FRO
      M 1 TO 5"
BX 20 GET A$:IF A$="" THEN 20
FJ 30 N=VAL(A$)
GS 40 IF N<1 THEN 20
ED 50 IF N>5 THEN 20
QA 60 PRINT N
```

As you know, GET receives one, and only one, character from the keyboard. In line 30, VAL checks to see if that character is a number. If it's not, a value of 0 is returned.

When you run this example, you'll see that it handles all types of characters. If you enter letters, for instance, line 40 sends control back to line 20 because N is equal to 0. Line 50 checks for digits greater than 5. If all is well, line 60 prints the value of the key pressed.

Let's see how VAL works with an INPUT statement:

```
AS 10 PRINT"{CLR}"
FC 20 PRINT"TYPE SEVERAL CHARA
      CTERS."
GK 30 INPUT W$
JH 40 W=VAL(W$)
JA 50 IF W=0 THEN PRINT"YOUR E
      NTRY DOES NOT BEGIN WITH
       A NUMBER.":END
MR 60 PRINT"YOUR ENTRY EQUALS"
      W
```

Enter this program and run it. If you enter a string that begins with numbers and ends with letters, VAL returns the value of the numbers. But if you began your entry with just one letter, W will equal 0, and line 50 will be executed.

Don't think that VAL is too smart. It's happy only if it finds a number as the first character in a string. If that first character is a number, VAL continues looking for numbers that follow. The first nonnumeric character VAL encounters stops it cold.

From Numbers To Strings

The STR$ function converts numbers into strings—the opposite of VAL. Try this example:

```
QJ 10 INPUT"WHAT IS A THREE-DI
      GIT NUMBER";N
PC 20 N$=STR$(N)
JX 30 IF LEN(N$)<>3 THEN PRINT
       N$" IS NOT THREE DIGITS
      ":GOTO 10
CB 40 PRINT"THANKS!"
```

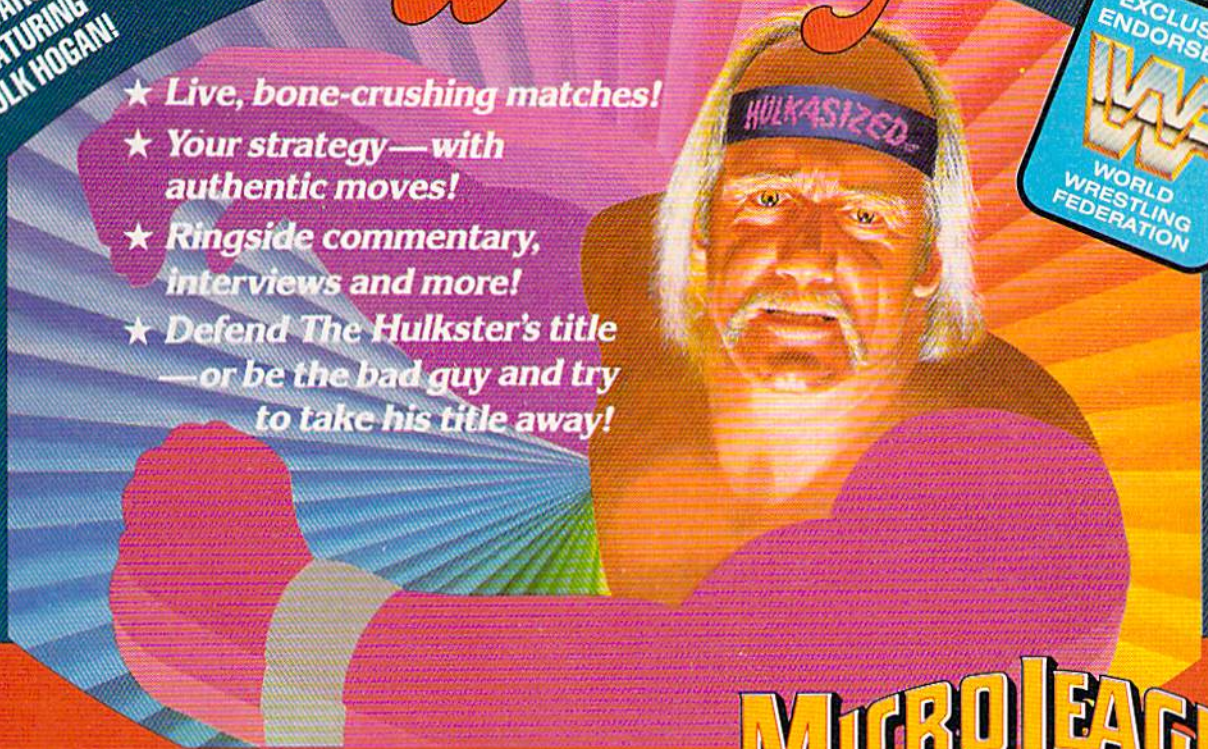
This program has all the makings of a real head-scratcher because it looks like it would work, but doesn't. Why not? Because, numeric variables always reserve a space in front for the sign (+ or −). Therefore, the actual length of a three-digit numeric string is 4. So, to check for a valid entry, we need to change line 30 to read:

```
GA 30 IF LEN(N$)<>4 THEN PRINT
       N$" IS NOT THREE DIGITS
      ":GOTO 10
```

NEW! from Micro League Sports

MICRO LEAGUE Wrestling®

REAL WWF STARS FEATURING HULK HOGAN!



★ *Live, bone-crushing matches!*
★ *Your strategy—with authentic moves!*
★ *Ringside commentary, interviews and more!*
★ *Defend The Hulkster's title —or be the bad guy and try to take his title away!*

EXCLUSIVELY ENDORSED BY WWF WORLD WRESTLING FEDERATION

From the team who brought you Micro League Baseball—the exclusive, award-winning game simulation—another exclusive . . .

Micro League and World Wrestling Federation Match Disk!!

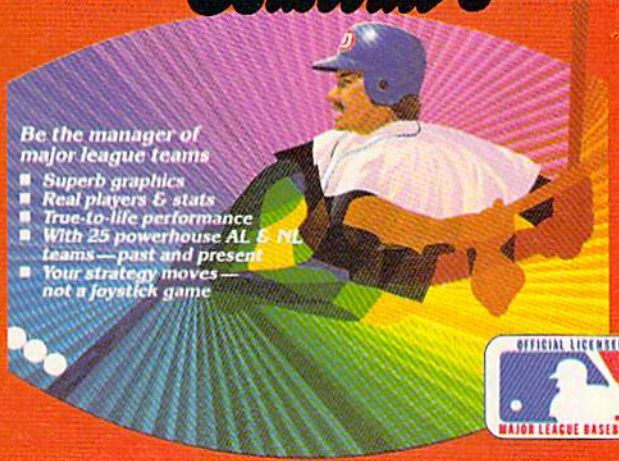
Featuring the Hulkster and some of the WWF's most infamous villains—all in real-life, digitized action.

Strap on Hulk Hogan's Championship belt or put on the bad guy's boots and *you* make the moves; body slam, leg drop, all the rest!

Take the challenge and step into the squared circle or pace in the dugout. Either way you'll be making all the strategy decisions.

Wrestling Disks available for: Commodore 64/128, Atari ST
Baseball Disks available for: Apple II Series, Commodore 64/128, IBM PC/PC Jr. and compatibles, Atari 65XE/130XE/800/XL.

MICRO LEAGUE Baseball™


Be the manager of major league teams
Superb graphics
Real players & stats
True-to-life performance
With 25 powerhouse AL & NL teams—past and present
Your strategy moves—not a joystick game
OFFICIAL LICENSEE
MAJOR LEAGUE BASEBALL

Micro League Sports Association
2201 Drummond Plaza, Newark DE 19711
302-368-9990

Check your software dealer or . . . direct Visa/MC orders call toll free 1-800-PLAYBAL

Putting VAL And STR To Work

Another very common use for VAL is with program menus. Take a look at this example, which also takes advantage of ON-GOTO:

```
AS 10 PRINT"{CLR}"
XK 20 PRINT:PRINT:PRINT"WHICH
      {SPACE}SURFACE WILL YOU
      {SPACE}MEASURE?"
CC 30 PRINT:PRINT"1. WALL"
AG 40 PRINT:PRINT"2. WINDOW"
AJ 50 PRINT:PRINT"3. DOOR"
HH 60 PRINT:PRINT"4. MISC."
FG 70 PRINT:PRINT"PRESS 1-4":P
      RINT
QG 80 GET N$:IF N$="" THEN 80
GG 90 ON VAL(N$) GOTO 110,120,
      130,140
GP 100 GOTO 80
AB 110 PRINT"WALL{2 SPACES}
      {UP}":GOTO 80
EC 120 PRINT"WINDOW{2 SPACES}
      {UP}":GOTO 80
MJ 130 PRINT"DOOR{2 SPACES}
      {UP}":GOTO 80
QX 140 PRINT"MISC.{2 SPACES}
      {UP}":GOTO 80
```

You may remember that ON-GOTO directs the flow of a program according to the number following the ON statement. The key line here is 90, which sends control to lines 110, 120, 130, or 140, depending on whether the user types a 1, 2, 3, or 4, respectively. Numbers entered are converted from A$ using the VAL function. If a number other than 1–4 is entered, line 100 sends control back to GET another character.

Let's finish by entering a short seasonal program which illustrates several of the string functions described.

```
MA 10 PRINT"HOW TALL IS YOUR T
      REE ";
MK 20 INPUT"(6 TO 19)";T$
HE 30 T=VAL(T$)
JQ 40 IF T<6 THEN RUN
EK 50 IF T>19 THEN RUN
BC 60 PRINT"NOW TYPE ANY"T"CHA
      RACTERS."
KG 70 INPUT C$:L=LEN(C$)
KQ 80 IF L<>T THEN 60
HF 90 PRINT"{CLR}"
PB 100 FOR J=1 TO 15-T:PRINT:N
      EXT
CH 110 FOR J=1 TO T
RP 120 PRINT TAB(20-J) LEFT$(C
      $,J) RIGHT$(C$,J):NEXT
HD 130 FOR J=1 TO 3:PRINT TAB(
      19)"***":NEXT
KS 140 GET K$:IF K$="" THEN 14
      0
```

Until next month, have a safe and happy holiday season.

COMPUTE!'s Gazette Subscriber Services

Please help us serve you better. If you need to contact us for any of the reasons listed below, write to us at:

COMPUTE!'s Gazette
P.O. Box 10957
Des Moines, IA 50340

or call the Toll Free number listed below.

Change of Address. Please allow us 6–8 weeks to effect the change; send your current mailing label along with your new address.

Renewal. Should you wish to renew your Gazette subscription before we remind you to, send your current mailing label with payment or charge number, or call the Toll Free number listed below.

New Subscription. A one-year (12-month) U.S. subscription to *COMPUTE!'s Gazette* is $24 (2 years, $45; 3 years, $65). For subscription rates outside the U.S., see staff page. Send us your name and address or call the Toll Free number listed below.

Delivery Problems. If you receive duplicate issues of *COMPUTE!'s Gazette*, if you experience late delivery, or if you have problems with your subscription, please call the Toll Free number listed below.

COMPUTE!'s Gazette
1-800-727-6937

Looking for a Supercartridge?? Don't finalize the deal!!

Are you thinking of buying a multi-function cartridge? Well, don't make a FINAL decision until you look at this comparison chart.

Super Snapshot 64 V2.0 has just been updated to make it an even better utility than before! We've even added features like system reset capability and a sector editor!

- Super Snapshot is upgradeable. There is no need to discard your cartridge for a new version.
- Copies most memory resident software on today's market.
- Snapshotted programs run without the SS cartridge.
- Our cartridge is easily updated with up to 40K.
- Our Turbo/DOS is the most compatible fast loader tested to date.
- Attention C128 owners: An optional switch is available which allows you to disable the C64 mode with cartridge in place. $5.00 additional.
- Super Snapshot 64 V1.0 owners may upgrade for $20.00. Contact us for details.
- Super Snapshot 64 is for the C64 or the C128 in the 64 mode.

Super Snapshot Only $54.95

Super Snapshot 64 (SS) Vs. the Final Cartridge® (FC)*	SS	FC
Compatible with ALL C64/C128/SX64/MSD/1541/1571/& 1581 equipment?	Y	N
Is the cartridge itself designed to be easily upgradeable?	Y	N
Features both pre-programmed and user-definable function keys?	Y	N
Will it print both multi-color and standard bit mapped screen dumps?	Y	N
How many different sizes can the screen dumps be printed at?	3	1
Save graphic screens to disk in either Koala™ or Doodle™ formats?	Y	N
Menu driven with easy to read, full screen windows?	Y	N
Features both a fast loader and a fast disk formating option?	Y	N
C-64™/1581 fast load support (20+ blocks/sec.)	Y	N
Unique "RESUME" feature (proof that SS does NOT corrupt memory)?	Y	N
Does the built-in Machine Language monitor corrupt memory (see above)?	N	Y
M/L monitor accessible from a running program with resume feature intact?	Y	N
How much ROM does the cartridge contain?	32	16
How much RAM does the cartridge contain?	8	0
Does the cartridge work with popular multi-slot expansion boards?	Y	N
Is ALL Ram and Rom accessible from the Machine Language monitor?	Y	N
Is the cartridge TOTALLY invisible to software when disabled?	Y	N
Supports C128 fast mode during screen dumps?	Y	N
Does the cartridge support multiple disk drives?	Y	N
Is the cartridge supported with a FREE **Kracker Jax** parameter disk?	Y	N
FREE shipping and handling on all orders within the United States?	Y	N

COMPUTER MART

Need more info? Call or write for our free catalog.

Program submissions wanted! Good Commissions— National Marketing.

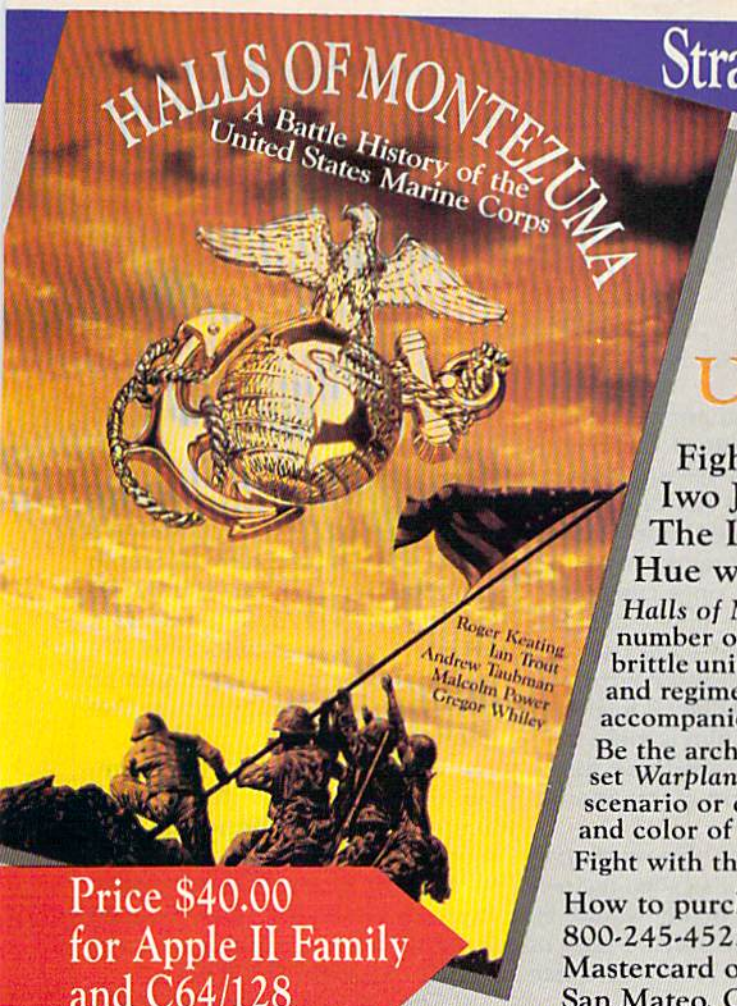
CHECKS, MONEY ORDERS OR VISA/MASTERCARD/DISCOVER: Mail your orders to: Computer Mart, 2700 NE Andresen Road, Vancouver, WA 98661 • Phone orders welcome: (206) 695-1393 Same day shipping. No C.O.D. orders outside U.S.

PLEASE NOTE: Free shipping & handling on all orders. • C.O.D. add $4.00 to total order. • All orders must be paid in U.S. funds. Washington residents add 7.30% sales tax to order. Orders outside of North America add $7.50 for shipping. In Canada, order from: Marshview Software, PO Box 1212, Sackville NB E0A-3C0. Only $69.95 CDN.

DEALERS—WE HAVE THE SUPPORT YOU'RE LOOKING FOR!

*Final Cartridge is a registered trademark of H & P Computers of America. Comparison date 8-1-87.

Strategic Studies Group Presents ...



Price $40.00 for Apple II Family and C64/128

Halls of Montezuma

A Battle History of the United States Marine Corps

Fight the battles of Mexico City, Belleau Wood, Iwo Jima, Okinawa — The Shuri Line, Okinawa — The Last Redoubt, Pusan Perimeter, Inchon and Hue with the elite fighting men of the US Marines.

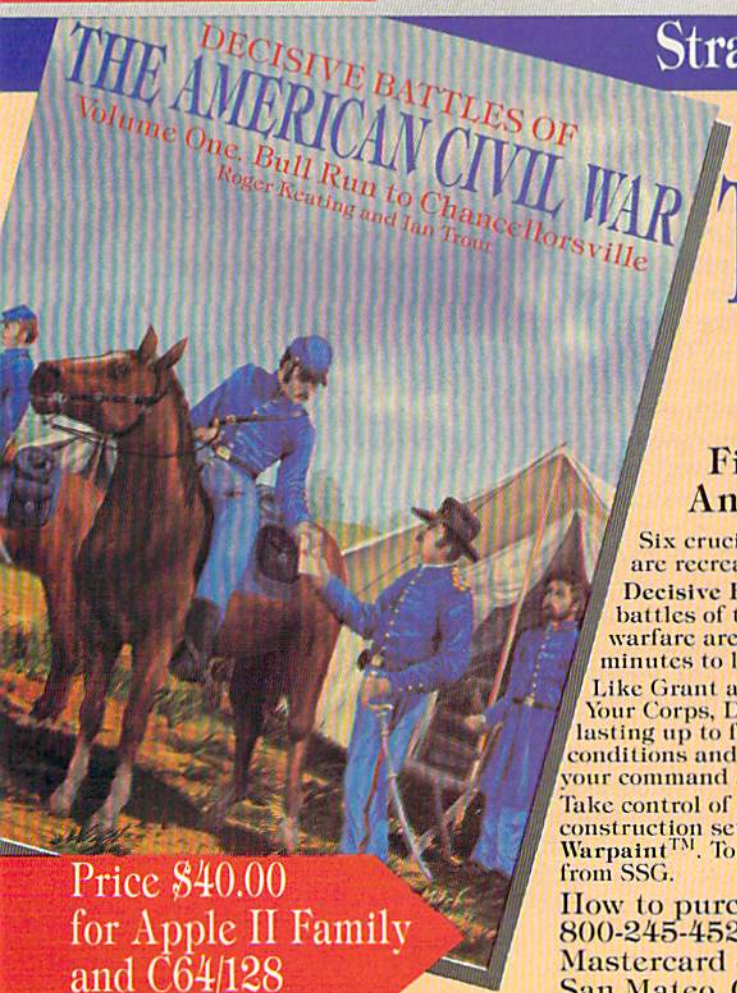
Halls of Montezuma uses the *Battlefront Game System* with a number of enhancements. These include: night capable units, brittle units, new reports structure, new graphics, improved movement and regimental integrity, and enhanced AI routines. The battles are accompanied by detailed historical articles and players notes.

Be the architect of victory with the complete wargame construction set *Warplan*™ and the total graphics editor *Warpaint*™. Alter any scenario or create new games with *Warplan*. Change the appearance and color of any game icon with *Warpaint*.

Fight with the best in *Halls of Montezuma* from SSG.

How to purchase. Visit your retailer or call Electronic Arts 800-245-4525 (in CA call 800-562-1112) for VISA or Mastercard orders or write to Electronic Arts, P.O. Box 7530, San Mateo, CA 94403.

Strategic Studies Group Presents ...



Price $40.00 for Apple II Family and C64/128

Decisive Battles of The American Civil War

Vol. 1 Bull Run to Chancellorsville

First Bull Run, Shiloh, Second Bull Run, Antietam, Federicksburg, Chancellorsville.

Six crucial battles spanning the first half of The American Civil War are recreated in SSG's Decisive Battles System.

Decisive Battles is SSG's new grand tactical simulation, suitable for battles of the eighteenth and nineteenth centuries. The many aspects of warfare are integrated into an easy to use system that takes ten minutes to learn.

Like Grant at Shiloh and Lee at Antietam, you command an entire army. Your Corps, Divisions and Brigades depend upon your direction in battles lasting up to four days. The American Civil War faithfully reflects the conditions and command structures of the time. On a pre-radio battlefield, your command abilities will be stretched to the limit.

Take control of your battlefield with SSG's comprehensive wargame construction set Warplan™ and the revolutionary graphics editor Warpaint™. Total command can be yours with The American Civil War from SSG.

How to purchase. Visit your retailer or call Electronic Arts 800-245-4525 (in CA call 800-562-1112) for VISA or Mastercard orders or write to Electronic Arts, P.O. Box 7530, San Mateo, CA 94403.

What Is This, The Runaround?

Todd Heimarck
Assistant Editor

Here's an experiment to try: Load a short BASIC program into a Commodore 64. Type LIST. There it is, the program you just loaded.

Now type POKE 775,191 and try to list the program. Nothing happens. LIST doesn't work. Type POKE 775,167 and the LIST command returns from wherever we sent it. Incidentally, the equivalents for the 128 are POKE 775,139 (disable LIST) and POKE 775,81 (enable).

How does a single POKE turn off a command like LIST? How does location 775 control the LIST command? Of all the numbers between 0 and 255, why would 191 turn off LIST and 167 turn it back on?

Maybe when you type LIST, a Commodore 64 PEEKs into 775. If it finds the magic number 167 there, it proceeds. If it discovers the magic number 191, it refuses to LIST. And maybe when the engineers sat down to design the 128, the boss said, "I'm getting kind of tired of 167 and 191. Let's make LIST search for 139 and 81 instead."

It's certainly possible, but it's not true.

LIST is a BASIC command, so it must be built into the computer. If it's built-in, it's part of read only memory (ROM). ROMs are unchangeable memory; you can PEEK (read) from ROM but not POKE (write) there. It doesn't seem possible that you can modify something that can't be modified. Moreover, the first ROM address in the 64 is location 40960, which is not even close to 775.

Spies And Blackmailers

You've probably seen movies where one person, usually a bad guy involved in nefarious activities like kidnapping or spying or blackmail, has something that another person (probably a good guy) wants to obtain. They make an arrangement to meet at a certain street corner at a certain time. The second person, lugging a briefcase full of cash, arrives at the appointed hour. The bad guy is nowhere in sight.

A pay phone rings and everybody watching the movie immediately knows that it's the bad guy calling. The character with the money is told to deliver it to another location. If the film is more than 30 years old, the good guy might say "What, are you giving me the runaround?"

In movies, it's the *runaround*, but in computers it's called *indirection*. The phone booth would be called a *vector*. The only purpose of a vector is to point somewhere else in memory.

The MAIN Loop

Back to LIST. The 64 has a loop called MAIN that continually checks for keys that you might have pressed. When you type a normal character, the ASCII value goes into the keyboard buffer, and, within 1/60 second, MAIN pulls it back out. MAIN then does two things: It prints the character to the screen and stores it in the input buffer. When you press RETURN, MAIN goes off to parse the input buffer. Lines that begin with numbers are BASIC program lines to be added to the program in memory. Lines that start with the letters A–Z are commands.

When you type LIST and press RETURN, the computer scans through its list of valid commands. Sure enough, LIST is there, so the 64 obeys you (if LIST weren't on the list, the computer would print ?SYNTAX ERROR).

The LIST command is in ROM, so the 64 executes a machine language JSR (Jump to SubRoutine) instruction, which is like a BASIC GOSUB, except instead of going to a line number, it jumps to an address in memory. The first thing the LIST routine in ROM does is an indirect jump (JMP) through a vector in RAM. JMP is similar to GOTO. An indirect JMP is like answering a phone and getting a new address to jump to. The LIST vector occupies locations 774–775. The program never actually goes to location 774 for ML instructions—it just gets an address from 774 and jumps to that location in memory.

But we've POKEd a new number into the vector. The indirect jump doesn't enter the normal LIST routine. Instead, it ends up somewhere else in memory, in a place that contains an RTS (ReTurn from Subroutine), which is like the BASIC command RETURN.

The LIST command still works (sort of), but it does a GOSUB/JSR to someplace that does an indirect GOTO/JMP to a location that turns out to be a RETURN/RTS. The POKE changed the vector so when you typed LIST, you returned to where you started. The program didn't list. You've given the computer the runaround.

There are lots of vectors, including one called IMAIN at 770–771. IMAIN points to the MAIN routine (remember MAIN, which sits around waiting for the user to type something?). After you load a program, BASIC jumps through the IMAIN vector because it has to find out if you're going to type some new lines, RUN, LIST, or whatever. If you change IMAIN to point to your own machine language routine and save memory from 770 to wherever your program is (there's some free memory at 679–767), then you'll have a program that will automatically run when you load it. That's how some boot programs work.

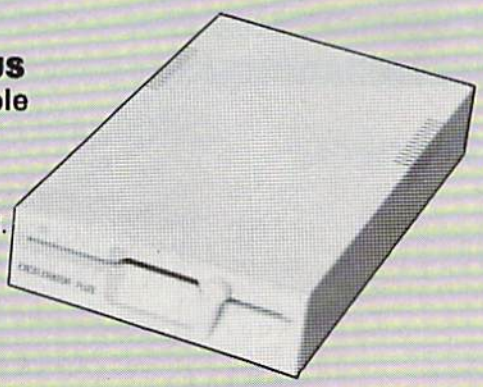
MERRY CHRISTMAS

HOLIDAY SPECIALS FROM ECI!

PERFECT PARTNER GIFT PACKAGE!

FSD-2
EXCELERATOR+ PLUS
Commodore Compatible Disk Drive

DIRECT DRIVE!
Compatibility Guaranteed. Faster, quieter and more reliable. External Device Switch. FULL ONE-YEAR WARRANTY!



$159

List Price: $219

SLIMLINE CASE

Dress up your C64 for the Holidays! New Slimline Case enhances the look of your C64.*

*Facilities for Reset and Dolphin DOS SW. Easy Installation.

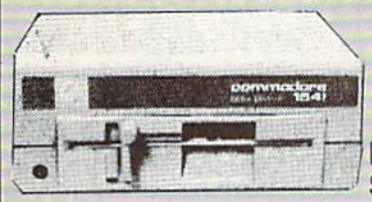
NOW ONLY $19.95 WHEN YOU BUY THE FSD-2!

ORDER THE SPECIALLY PRICED FSD-2 & SLIMLINE CASE NOW, AND WE'LL SEND YOU FREE SURPRISE SOFTWARE! (NO shipping or handling charges if you order NOW!)

EXCEL 2001
THE 1571 Compatible Disk Drive.
Fully compatible with C128. Ultimate reliability. Compatibility guaranteed. FULL ONE-YEAR WARRANTY. Satisfaction Guaranteed!

List Price: $349

$209

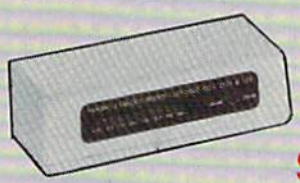


COMMODORE 1541C DISK DRIVE

HOLIDAY SPECIAL $169

SPECIAL PRICES! **HARDWARE & ACCESSORIES** SPECIAL PRICES!

1200 BAUD MODEM



Supports both 1670 and Hayes Modes with many attractive features.

$129

MOUSE

$36

JOYSTICK

$9.95

FREEZE MACHINE

The ultimate archival device. Totally unstoppable freeze utility. Built-in file copier. Two fastloads! **$34.95**

AMBER MONITOR $79

CALL NOW FOR MORE HOLIDAY HARDWARE, SOFTWARE AND ACCESSORY SPECIALS!

ALL MAJOR CREDIT CARDS ACCEPTED

VISA · AMERICAN EXPRESS · MasterCard · DISCOVER

6 AM TO 6 PM
6 DAYS A WEEK

Emerald Components International
P.O. Box 1141 / Eugene, OR 97440
In Oregon, call: 503/741-2396
Customer Service: 503/741-2396

*Commodore is a registered Trademark of Commodore Business Machines, Inc.

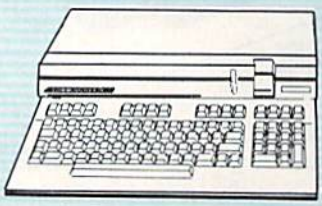
ECI 1-800-356-5178

Lyco Computer

Marketing & Consultants

Since 1981

COMMODORE 128D System



Commodore 128D Plus Thomson 4120 Monitor $659.95

$439.95

COMMODORE 128D System Special

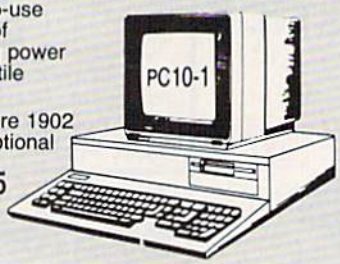
- Commodore 128D Computer/Drive
- Thompson 4120 Monitor

$649.95

COMMODORE PC 10-1

- A ready-to-use package of computing power and versatile graphics!
- Commodore 1902 monitor optional

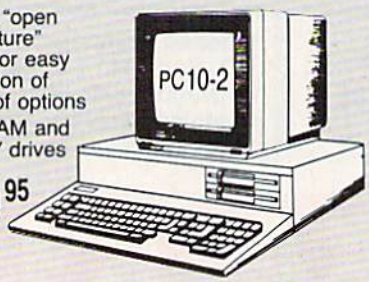
$489.95



COMMODORE PC 10-2

- Flexible "open architecture" design for easy installation of variety of options
- 640K RAM and two 5¼" drives

$589.95



COMMODORE HARDWARE

1541 C Disk Drive	$168.95
1571 Disk Drive	$219.95
1581 Disk Drive	$LOWEST
Indus GT C-64 Drive	$169.95
Blue Chip 64C Drive	$139.95
Blue Chip C 128 Drive	$195.99
1802C Monitor	$189.95
2002 Monitor	$239.95
1901 Monitor	$CALL
64 C Computer	$LOW
128D Computer/Drive	$439.95
1670 Modem	$CALL
C-1351 Mouse	$32.95
1700 RAM	$109.95
C-1750 RAM	$169.95
1764 RAM C64	$124.95

Attention Educational Institutions:

If you are not currently using our educational service program, please call our representatives for details.

PC COMPATIBLE HARDWARE

PC 5¼ Drive	$119
MS DOS + Basic Soft	$59
BCM 12G Gr. Monitor	$89
BCM 12A Am. Monitor	$89
BCM 14C Color RGB Monitor	$269
BCC CG Color Card	$94.99
BCPC PC/XT Comp	$559
Avatex Graphics Card	$169
Zuckerboard	$CALL
Iomega Bernoulli	$CALL
Hercules	$CALL
AST	$CALL

Seagate HARD DRIVES

20 meg kit	$275.95*
30 meg kit	$315.95*
40 meg kit	$489.95*

*Drives include controller

40 meg w/o controller	$425.95

COMMODORE 64C COMPUTER

~~$299.95~~

Call For November Special!

Priced too low to print.

COMMODORE 64C System

$464.95

- Commodore 64 C Computer
- Commodore 1541 C Drive
- Star NP 10 Printer

BLUE CHIP PERSONAL COMPUTER

- 100% IBM PC/XT compatible!

$479.95

(Green, amber & color monitors available)

BLUE CHIP special

- Blue Chip Personal Computer
- Seagate 20 Meg Hard Drive

$799.95

(Hard drive must be installed)

1-800-233-8760

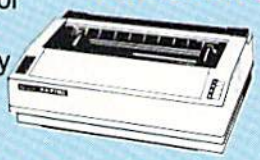
Price Guarantee

Since 1981, we have led the industry by continuing to offer the lowest national prices while providing quality service. Many companies have come and gone trying to imitate our quality and service. If by some oversight we do not have the lowest prices advertised on the products you desire, then we would appreciate the opportunity to rectify this oversight.

New 1080i Model II

- Now 150 cps Draft Mode
- NLQ Mode
- Friction & Tractor Feed
- 2-Year Warranty

Panasonic 1080i *Model II*



$157.95

Monitors

Thomson:

230 Amber TTL/12"	$85
450 Amber TTL/15"	$149
980 White TTL/20"	$695
4120 CGA	$225.95
4160 CGA	$289
4460 EGA	$359

Zenith:

ZVM 1220	$89
ZVM 1230	$89

Blue Chip:

BCM 12" Green	$79
BCM 12" Amber	$89
BCM 14" Color	$269

NEC:

Multisync	$549

Compare & Save $24.00
Thomson 4375 UltraScan $525.95

THOMSON 4120 Monitor

- 14" RGBI/video composite/analog
- Compatible with IBM and Commodore
- RGB data cable included

$225.95

Modems

Avatex:

1200i PC Card	$99.95
1200hc Modem	$99.95
2400	$214.95
2400i PC Card	$CALL

Hayes:

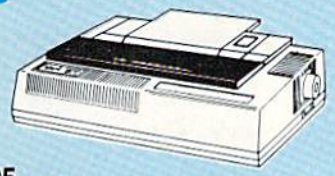
Smartmodem 300	$149.95
Smartmodem 1200	$284.95
Smartmodem 2400	$425.95

Wide Carriage Special

star MICRONICS, INC

NX-10

- 120 cps Draft
- EZ Front Panel Selection
- NLQ Mode



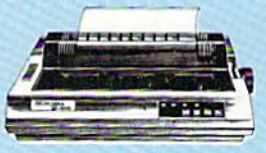
$144.95

Great Performance Great Price

SEIKOSHA SP 180VC

- 100 cps draft
- 20 cps NLQ
- direct connect for Commodore

$124.95



PRINTERS

SEIKOSHA

SP 180Ai	$124.95
SP 180VC	$124.95
SP 1000VC	$135.95
SP 1200VC	$144.95
SP 1200Ai	$155.95
SP 1200AS RS232	$155.95
SL 80Ai	$295.95
MP1300Ai	$299.95
MP5300Ai	$375.95
BP5420Ai	**$879.95**
SP Series Ribbon	$7.95
SK3000 Ai	$349
SK3005 Ai	$429

BROTHER

M1109	$195
M1409	$299
M1509	$365
M1709	$475
Twinwriter 6 Dot & Daisy	$899
M1724L	$625
HR20	$339
HR40	$569
HR60	$709.95

star MICRONICS, INC

NP-10	$129.95
NX-10	$144.95
NX-10C w/Interface	$165.95
NL-10	$195.95
NX-15	$289.95
ND-10	$249.95
ND-15	$375.95
NR-15	$409.95
NB-15 24 Pin	$699.95
NB24-10 24 Pin	$409.95
NB24-15 24 Pin	$549.95

Toshiba

321SL	$489
341 SL	$659
P351 Model II	$899

DIABLO

D25	$499.95
635	$779.95

EPSON

LX800	$185.95
FX86E	$299.95
FX286E	$449.95
EX800	$399.95
EX1000	$499.95
LQ800	$369.95
LQ1000	$539.95
LQ2500	$879.95
GQ3500	$LOW
LQ850	$499.95
LQ1050	$679.95

OKIDATA

Okimate 20	$119
Okimate 20 w/cart	$179.95
120	$189.95
180	$219.95
182	$229.95
192+	$309.95
193+	$449.95
292 w/interface	$449.95
293 w/interface	$589.95
294 w/interface	$839.95
393	$989.95

Panasonic

1080i Model II	$157.95
1091i Model II	$179.95
1092i	$295
1592	$379
1595	$419
3131	$259
3151	$399
KXP 4450 Laser	$CALL
1524 24 Pin	$549.95

SILVER REED

EXP 420P	$199
EXP 600P	$499
EXP 800P	$649

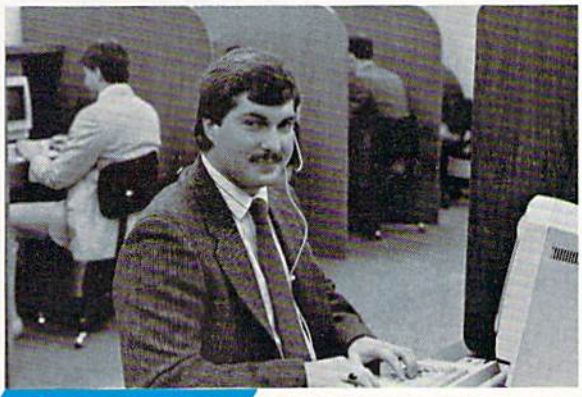
CITIZEN

120 D	$164.95
MSP-10	$259.95
MSP-20	$289.95
MSP-15	$324.95
MSP-25	$389.95
MSP-50	$375
MSP-55	$CALL
Premiere 35	$464.95
Tribute 224	$624.95

Join the thousands who shop Lyco and Save!

We stock interfacing for Atari, Commodore, Apple and IBM.

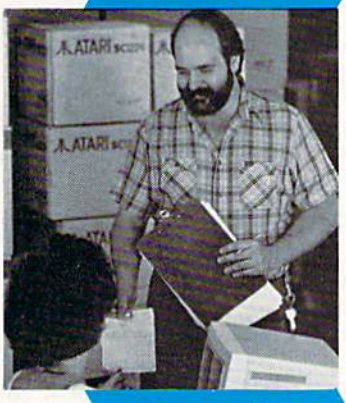
Lyco Means Total Service.



Mark "Mac" Bowser, Sales Manager

I would personally like to thank all of our past customers for helping to make Lyco Computer one of the largest mail order companies and a leader in the industry. Also, I would like to extend my personal invitation to all computer enthusiasts who have not experienced the services that we provide. Please call our trained sales staff at our toll free number to inquire about our diverse product line and weekly specials.

Call Lyco



First and foremost our philosophy is to keep abreast of the changing market so that we can provide you with not only factory-fresh merchandise but also the newest models offered by the manufacturers at the absolute best possible prices. And we offer the widest selection of computer hardware, software and accessories.

Feel free to call Lyco if you want to know more about a particular item. I can't stress enough that our toll-free number is not just for orders. Many companies have a toll-free number for ordering, but if you just want to ask a question about a product, you have to make a toll call. Not at Lyco. Our trained sales staff is knowledgeable about all the products we stock and is happy to answer any questions you may have. We will do our best to make sure that the product you select will fit your application. We also have Saturday hours — one more reason to call us for all your computer needs.

Order Now

Once you've placed your order with Lyco, we don't forget about you. Our friendly, professional customer service representatives will find answers to your questions about the status of an order, warranties, product availability, or prices.

Lyco Computer stocks a multimillion dollar inventory of factory-fresh merchandise. Chances are we have exactly what you want right in our warehouse. And that means you'll get it fast. In fact, orders are normally shipped within 24 hours. Free shipping on prepaid cash orders over $50, and there is no deposit required on C.O.D. orders. Air freight or UPS Blue/Red Label shipping is available, too. And all products carry the full manufacturers' warranties.

Here's How

I can't see why anyone would shop anywhere else. Selection from our huge in-stock inventory, best price, service that can't be beat — we've got it all here at Lyco Computer.

TO ORDER, CALL TOLL-FREE: 1-800-233-8760
New PA Wats: 1-800-233-8760
Outside Continental US Call: **1-717-494-1030**

Hours: 9AM to 8PM, Mon. - Thurs.
9AM to 6PM, Friday — 10AM to 6PM, Saturday

For Customer Service, call 1-717-494-1670,
9AM to 5PM, Mon. - Fri.
Or write: Lyco Computer, Inc.
P.O. Box 5088, Jersey Shore, PA 17740

Risk-Free Policy: • full manufacturers' warranties • no sales tax outside PA • prices show 4% cash discount; add 4% for credit cards • APO, FPO, international: add $5 plus 3% for priority • 4-week clearance on personal checks • we check for credit card theft • compatability not guaranteed • return authorization required • price/availability subject to change

New Item!

Computer Area Light Center
- Heavy-duty weighted base for extra stability
- Built-in storage for disks, pens, and paper
- Two-hinged desktop arm for optimal positioning

Introductory price: $29.95

(Includes delivery)

Disc Storage

QVS-10 5¼	$3.99
QVS-75 5¼	$16.95
QVS-40 3½	$11.95

Great News

Peak Peripherals RS232 Modem adapter for C64/128

- Adapts std DB25 Modem to your Commodore computer

Only $19.95

Printer Interfaces

Xetec Jr	$38.95
Xetec Supergraphics	$58.95
PPI	$45.95
Cardco GWhiz	$35.95
Cardco Super G	$45.95

Special Purchase

Data Share-Messenger Modem

300 Baud Auto Dial/Auto Answer Modem

Only $29.95

Great Bargain

Contriver M-1 Mouse
- Works with Geos
- Complete with Graphic Utility Software

Only $32.95

Mouse Pad

- provides clean, dust-free surface for your mouse
- No-mar backing to protect your desk surface

9x11 .... $10.95

Disk

5-1/4

Maxell:
SSDD .....
DSDD .....

Bonus:
SSDD .....
DSDD .....

SKC:
DSDD .....
DSHD .....
Generic DSDD ..

Verbatim:
SSDD .....
DSDD .....

3.5

Maxell:
SSDD .....
DSDD .....

Verbatim:
SSDD .....
DSDD .....

SKC:
SSDD .....
DSDD .....
Generic SSDD ..
Generic DSDD ..

Fre
Disk Storage
w/purchase o

Joyst

Tac 3 .....
Tac 2 .....
Tac 5 .....
Tac 1 + IBM/AP
Economy .....
Slik Stick .....
Black Max .....
Boss .....
3-Way .....
Bathandle .....
500XJ .....
500XJ-Apple/PC
Winner 909 .....
Wico IBM/AP ....
Contriver Joystick

Dustc

Pan 1081 .....
Pan 1091 .....
Epson FX286 ....
Epson FX86 .....
Epson LX86 .....
Star NX10 .....
Star SR10 .....
Star SR15 .....
Oki 182-192 .....
Seikosha SP seri
PC Color .....
C128 .....
1571 .....
Amiga .....

Prin Pap

200 sheet laser ..
1000 sheet laser
150 sheet ivory, 2

MasterCard VISA

SSORIES — SOFTWARE

ettes

...$8.99
...$9.99
...$6.45
...$6.95
...$7.99
...$16.95
...$6.99
...$9.95
...$12.95
...$12.50
...$17.99
...$12.99
...$18.99
...$11.99
...$14.99
...$13.95
...$15.95

e
Case
f 5 boxes

icks

...$9.95
...$10.95
...$12.95
...$26.95
...$5.95
...$6.95
...$10.95
...$11.99
...$19.99
...$16.75
...$13.95
...$28.95
...$24.95
...$29.95
Bd ..$34.95

overs

...$9.95
...$9.95
...$14.95
...$9.95
...$9.95
...$9.95
...$9.95
...$14.95
...$9.95
es ...$9.95
...$14.95
...$9.95
...$9.95
...$14.95

ter
er

...$9.95
...$19.95
0lb ...$9.95

Printer Paper

150 sheet white, 20lb $9.95
1000 sh. Gr. bar 14" ... $29.95
1000 mailing labels $9.95

Surge Suppressors

QVS Surge 6-outlet $24.95
QVS Surge 6-outlet with EMI/RFI $32.95
QVS Surge 6-outlet with indicator $29.95
QVS 6-out. Pow. Strip . $14.95

Drive Maintenance

Nortronics 5¼ Drive Cleaner $9.95
Nortronics 5¼ Drive Cleaner Kit $17.95

Switch Boxes

Cent '25' AB $49.95
Cent '36' AB $49.95
RS232 ABC $52.95
Cent ABC $54.95
RS232 ABCD $59.95
Cent ABCD $59.95

Color Ribbons Available

Video Tape

SKC T120 VHS Video Tape:

each $4.49
3 pack $12.75
10 pack $39.90

Closeouts!

Factory Fresh Special Pricing Call for Availability

Quantum Link ..... $SAVE
Leading Edge ..... $SAVE
Computer Cover-up (dustcovers) ..... $SAVE
Novation modems ..... $SAVE
Anchor modems ..... $SAVE
Certron ..... $SAVE
Toshiba VCR's ..... $SAVE
Teknika Monitors ..... $SAVE
Panasonic Monitors ..... $SAVE
Dennison Diskettes ..... $SAVE

Great savings on Epyx, Cardco, Eastern House, High Tech Expressions, Timeworks, Spinaker, Scarborough, Continental, and much more!!

Generic Ribbons

Save up to 50% off brand prices! Call for your make and model!

COMMODORE

Access:
Echelon $25.95
Leader Board $22.95
Mach 5 ..... $19.95
Mach – 128 ..... $28.95
10th Frame $22.95
Triple Pack $11.95
Wld. Cl. Leader Brd. ... $22.95
Famous Courses #1 ... $11.95
Famous Courses #2 ... $11.95

Action Soft:
Up Periscope $18.95
Thunder Chopper ..... $NEW

Activision:
Aliens $19.95
Champion. Basketball . $19.95
Hacker $8.95
Hacker 2 ..... $19.95
Labyrinth $19.95
Music Studio $19.95
Tass Times $16.95
Titanic $11.95
Leather Goddesses $22.95
Stationfall $19.95
Lurking Horror $19.95
Top Fuel Eliminator $15.95

Berkeley Softworks:
Geos $35.95
Deskpak I $20.95
Fontpak I $17.95
Geodex $23.95
Geofile $29.95
Writers Workshop $29.95
Geo Calc $29.95

Broderbund:
Bank St. Writer $27.95
Carmen San Diego $19.95
Graphic Lib. I, II, III $13.95
Karateka $12.95
Print Shop $25.49
Print Shop Compan. $22.95
Print Shop Paper $12.95

Epyx:
Create A Calendar $15.95
Destroyer $22.95
Fastload $19.95
Football $11.95
Movie Monster $11.95
Sub Battle $22.95
Winter Games $22.95
California Games $22.95
Super Cycle $11.95
Graphics Scrapbook $11.95
Str. Sports Basketball . $22.95
Wld.'s Great Baseball . $11.95
Summer Games II $22.95
Vorpol Utility Kit $11.95
World Games $22.95

Firebird:
Colossus Chess IV $19.95
Elite $18.95
Golden Path $22.95
Guild of Thieves $22.95
Pawn $22.95
Talking Teacher $22.95
Tracker $22.95
Starglider $22.95
Sentry $22.95

Microleague:
Microleag. Baseball $22.95
General Manager $16.95
Stat Disk $13.95
'86 Team Disk $11.95
Microleag. Wrestling ..... $New

Microprose:
F-15 Strike Eagle $19.95
Gunship $19.95
Kennedy Approach $13.95
Silent Service $19.95

COMMODORE

Solo Flight $13.95
Top Gunner $13.95

Origin:
Autoduel $28.95
Ultima III $22.95
Ultima IV $33.95
Moebius $22.95

Springboard:
Newsroom $29.95
Certificate Maker $29.95
Clip Art Vol. #1 ..... $17.95
Clip Art Vol. #2 ..... $23.95
Clip Art Vol. #3 ..... $17.95
Graphics Expander $21.95

Strategic Simulations:
Gemstone Healer $16.95
Gettysburg $33.95
Kampfgruppe $33.95
Phantasie II $22.95
Phantasie III $22.95
Ring of Zelfin $22.95
Road War 2000 ..... $22.95
Shard of Spring $22.95
Wizards Crown $22.95
War in the S. Pacific ... $33.95
Wargame Constr. $16.95
Battlecruiser $33.95
Gemstone Warrior $7.95
Battle of Antetiem $28.95
Colonial Conquest $22.95
Computer Ambush $33.95
B-24 ..... $19.95

Sublogic:
Flight Simulator II $31.49
Jet Simulator $24.95
Night Mission Pinball ... $18.95
Scenery Disk 1-6 ..... $12.95

Timeworks:
Partner C64 ..... $24.95
Partner 128 ..... $39.95
Swift Calc 128 ..... $29.95
Wordwriter 128 ..... $29.95

Unison World:
Art Gallery 1 or 2 ..... $14.95
Print Master $17.95

AMIGA

Access:
Leader Board $24.95
10th Frame $24.95
Tournament #1 ..... $14.95

Activision:
Champ. Basketball $27.95
Championship Golf $24.95
GFL Football $27.95
Hacker $16.95
Hacker 2 ..... $24.95
Music Studio $29.95
Tass Times $24.95

Epyx:
Apshai Trilogy $13.95
Rogue $22.95
Winter Games $22.95
World Games $22.95

Firebird:
Guild of Thieves $26.95
Pawn $26.95
Starglider $26.95

Microprose:
Silent Service $24.95

Sublogic:
Flight Simulator II $32.95
Jet Simulator $32.95
Scenery Disk $17.95

AMIGA

Unison World:
Print Master $24.95
Art Gallery 1 or 2 ..... $18.95

IBM

Access:
Wld. Cl. Leader Board . $27.95
10th Frame $27.95

Activision:
Pebble Beach Golf $22.95
Champ. Baseball $22.95
Champ. Basketball $22.95
Zork Trilogy $39.95
Leather Goddesses $22.95
Moonmist $22.95

Broderbund:
Ancient Art of War $25.95
Print Shop $32.95
Print Shop Compan. $31.95
Graphic Lib. I or II $19.95
Karateka $19.95
Toy Shop $22.95
Bank St. Writer + ... $44.95

Epyx:
Apshai Trilogy $11.95
Create A Calendar $15.95
Destroyer $22.95
Movie Monster $11.95
Rogue $16.95
St. Sports Basketball ... $22.95
Sub Battle Simulator ... $22.95
Winter Games $22.95
World Games $22.95

Firebird:
Starglider $25.95
Guild of Thieves $25.95

Microleague:
Microleag. Baseball $22.95
General Manager $16.95
Stat Disk $13.95
'86 Team Disk $11.95

Microprose:
Conflict in Vietnam $22.95
Crusade in Europe $22.95
Decision in Desert $22.95
F-15 Strike Eagle $22.95
Silent Service $22.95
Gunship $27.95

Origin:
Ultima I $22.95
Ultima III $22.95
Ultima IV $33.95
Moebius $33.95
Ogre $16.95

Strategic Simulations:
Road War 2000 ..... $22.95
Kampfgruppe $33.95
Shard of Spring $22.95
Battle of Antetiem $33.95
Computer Baseball $7.95
Gettysburg $33.95
Wizards Crown $22.95
Chickamauga $33.95

Sublogic:
Jet Simulator $31.49
Scenery Japan $17.95
Scenery San Fran. $17.95
Scenery #1-#6 ..... $64.95
Flight Simulator $34.95

Timeworks:
Swiftcalc $39.95
Wordwriter $34.95

Unison World:
Art Gallery 2 ..... $14.95
News Master $49.95
Print Master (+) $29.95
Fonts & Borders $17.95

computing for families

So Where Is The Robot?

Fred D'Ignazio
Associate Editor

This is my inaugural GAZETTE column in my new town of Lansing, Michigan. I'm writing it in my hotel room on my computer. Outside my window, I can see tractor trailers, brilliantly lit by the late afternoon sun as they roar down the interstate. The room is quiet except for the clickety-click of my computer keys and the soft crooning of Bobby Goldsboro on the local "easy listening" radio station.

I'm alone in my room with my trusty cat Mowie. We're the advance scouts for the move. The rest of my family will be joining us in a few days. I feel very complete here in the room, just Mowie, my computer, and me. I don't even notice the lack of a robot.

A robot?

A few years ago in my GAZETTE columns I predicted that most computer companies would soon be manufacturing personal robots. I even wrote a book (*Working Robots*, Dutton, 1982) in which I foresaw the invention of robot "friends." So what happened? Where are all the robots? How come there isn't a robot friend here in my room with me and Mowie?

A Stalled Revolution

I hate to admit it, but the robot revolution has stalled. Notice I don't say failed, just stalled. But the immediate result is the same. Personal robots remain an expensive curiosity—more the stuff of science fiction than of Sears.

Why? It's plain to see. All I have to do is look around me. I have just driven almost a thousand miles to this hotel room on the outskirts of Lansing, Michigan. Except for my little green duffle bag, the only two things I brought in my room are my computer and my cat. I brought the computer because it is an indispensable tool and, I confess, I can't bear to be without it. I brought the kitty because she would have complained bitterly had I left her in the car and because I can't bear to be without her either.

I own over 20 personal robots. So why didn't I carry a robot with me and bring it into the room? Because the robot doesn't have a reason to be in the room. Unlike my computer, there is no robot on the market which qualifies as an "indispensable tool." And there is no robot around that could be a family pet and take the place of Mowie.

This is not to say robots haven't tried. During the late 1970s and early 1980s, robot manufacturers made robots which they claimed could become your playmate and your personal butler. But this claim was highly exaggerated if not completely false. I worked with many of these robots, and I ended up spending so much time programming them, debugging the programs, and guiding them around the house, it was more like caring for a mischievous toddler than having a butler or a friend.

Lots Of Fun, But . . .

At one time we even ran our own robot "hotel." The guests in our hotel were hilarious, but they made our lives chaotic. They got stuck under the kitchen table. They spilled drinks. They fell down the stairs. They held conversations with the trash can. They chased after Mowie. They activated our burglar alarm when we came home from parties. They got lost underneath couches. They insulted our guests. And they were constantly underfoot—whirring, whizzing, clicking, and saying silly things like "Old McDonald had a robot. Ee-yi, ee-yi, oh!"

The robots that came the closest to *tool* or *pet* were the Hubot from Hubotics and the HEROjr from Heath. Hubot didn't pretend to be a robotic handyman; Hubotics didn't claim that its robot could wash the dishes, take out the trash, or mow your lawn. Instead, Hubot concentrated on things a robot could do: It could be a portable entertainment, data processing, and communications center. Hubot had a TV in its belly along with a computer and videogame machine. You could have an optional telephone installed.

And HEROjr was cute! It toddled around happy as a lark, singing songs, and chatting with anything that crossed its path. If it got stuck (and it often did), it began moaning, "Help . . . Help. . . ."

But neither robot took the country by storm. Neither was ever as successful as computers or cats. And, as I sit here pecking away on my computer and feeling my cat's tail curl softly around my foot, I think I know why. Neither robot crossed the fine, invisible line between *novelty* and *necessity*. Computers are slowly but surely gaining in popularity because people are finding they can do things better on their computers—things that *have to be done*. Cats have their own hook—their ability to love. Quite simply, we love them because they love us. They are loyal, they trust us, they depend on us—we can't help but love them.

So, here I sit in my hotel room with my computer at my fingertips and my cat at my feet. But no robot. I can't live without my cat or my computer, but as much as I like robots, I can live without them.

How about you? What would it take to make robots a necessary part of your life? Please write me and let me know.

Fred D'Ignazio
c/o COMPUTE!'s Gazette
324 W. Wendover Ave.
Greensboro, NC 27408

The new Commodore® Amiga® 500 is everything you never expected from a home computer. That's because we designed it to excite you. To dazzle your senses with 4096 colors and stereo sound. To unleash your creativity. To allow things you never dreamed possible in a home computer. Because until now, they really weren't.

Like built-in speech synthesis, so you'll always have someone to talk to. Pro-quality 3-D animation that lets even beginners put their ideas in motion. Colorful educational programs that make lessons fun and memorable. A complete home office with powerful spreadsheet and database programs—even word processing with WordPerfect.® And unlike any other home computer, the Commodore Amiga 500 can multi-task, so you can run several programs *at the same time.*

Hook it to your VCR with an optional RF modulator, and the Commodore Amiga 500 becomes a home video production center. Paint graphics over video images. Create moving 3-D titles. Produce your own animated feature.

And for pure fun, enter the incredible world of stereo Amiga video games. With graphics so good, major video game makers use them in their coin arcade machines.

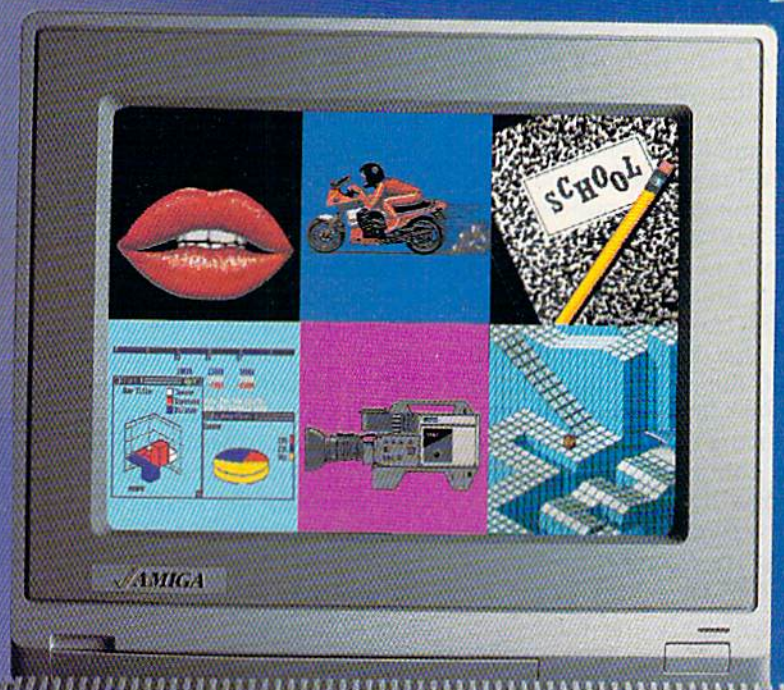
AND NOW YOU CAN SEE IT ALL, FREE.

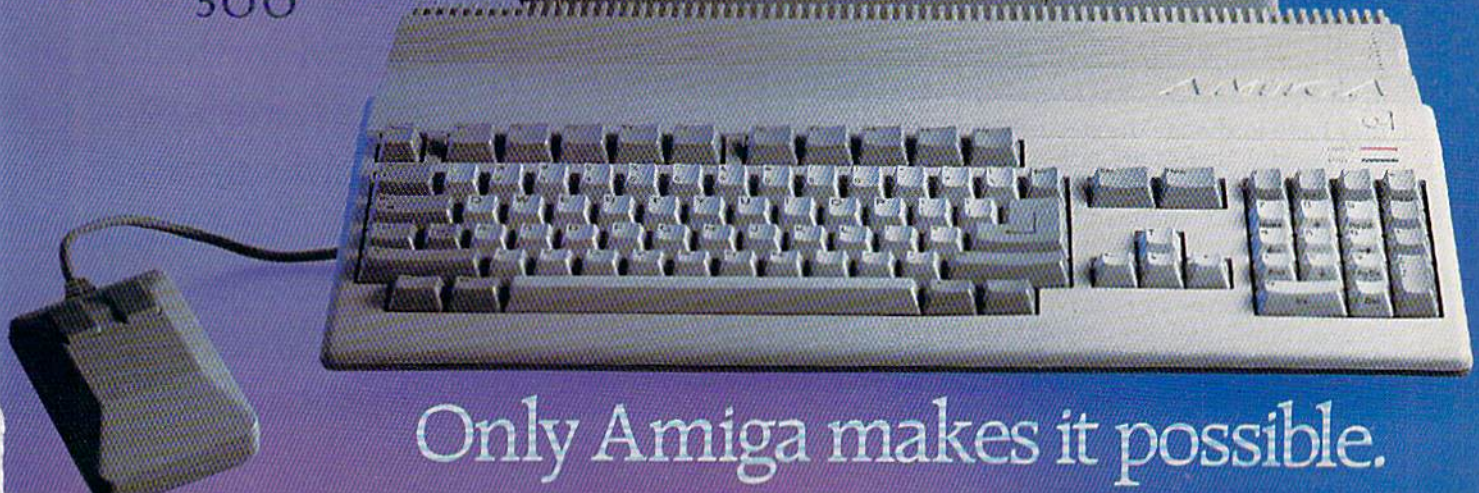
We captured the excitement, beauty, and power of the Commodore Amiga 500 on a special VHS video cassette called The Amiga 500 Video Test Flight. If you're ready for the ride of your life, call 1-800-87-AMIGA or contact your Commodore Amiga dealer to find out how you can get your free video demonstration.

1-800-87-AMIGA

COMMODORE AMIGA™ 500

It talks.
It animates.
It educates.
It's a home office.
It's a video studio.
It's arcade games in stereo.
It's the new Commodore Amiga 500 home computer.





Only Amiga makes it possible.

Commodore is a registered trademark of Commodore Electronics, Ltd. Amiga is a registered trademark, and the Amiga logo a trademark of Commodore-Amiga, Inc. WordPerfect is a registered trademark of the WordPerfect Corporation. Marble Madness game screen courtesy of Electronic Arts. MaxiPlan business graphic courtesy of Oxxi, Inc. Motorcycle animation screen courtesy of Aegis Development.

If you've discovered a clever time-saving technique or a brief but effective programming shortcut, send it to "Hints & Tips," c/o COMPUTE!'s Gazette. If we use it, we'll pay you $35. We regret that, due to the volume of items submitted, we cannot reply individually to submissions.

Quick Line Delete

Joseph R. Charnetski

The 128, Plus/4, and 16 each have a DELETE command that makes it easy to do away with BASIC program lines that you no longer need. Unfortunately, BASIC 2.0 lacks this useful command. When you wish to delete a line on the 64, you must type the proper line number and press RETURN. Needless to say, deleting a large group of lines can be tedious. One solution is to use "MetaBASIC" or another programming aid that includes a DELETE command. But if you just want to delete a few lines, you might not want to load a utility.

One common solution is to write a one-line program to list lines to the screen, such as

```
FOR I=3000 TO 3200 STEP
  10:PRINTI:NEXT
```

This will list 20 line numbers to the screen in the range 3000 to 3200. To delete the lines, just press RETURN on each number. If your program isn't numbered in increments of 10, you'll miss some lines, so you may have to change the step value.

Luckily, there's an easier way. First, type **POKE 774,0**. This POKE makes the LIST command list line numbers only. The contents of the line are still in memory, but only the line numbers print to the screen. Now, just list a range of lines.

```
LIST 3000-3200
```

Then press RETURN on each line you want to delete. When you want to return the LIST command to normal operation, type **POKE 774,26** or press RUN/STOP–RESTORE.

VIC Speed For The 64

Geoff Larsen

The 1540 disk drive (which was designed for the VIC computer) was a faster drive than its offspring, the 1541. The difference in speed is, believe it or not, related to the screen sizes of the VIC and the 64. The VIC's smaller screen puts less of a demand on the system. (The VIC has a screen size of 22 characters across by 23 characters vertically, while the 64's screen is 40 by 25.) On the VIC, 4048 bytes of memory had to be read and displayed, but 8000 need to be read and displayed on the 64. The 64 can't keep up with the 1540 unless you turn off the screen.

If you are willing to turn off the screen, you can put the 1541 into 1540 mode with one simple disk drive command. This is especially useful from within a program that needs to read or write to disk. The following line blanks the screen and speeds up the serial bus:

```
POKE 53265,PEEK(53265)AND239:
  OPEN15,8,15,"UI-":CLOSE15
```

And this line returns the screen and drive to normal:

```
POKE 53265,PEEK(53265)OR16:
  OPEN15,8,15,"UI+":CLOSE15
```

This technique is most useful for reading and writing files from within a program. Be sure to warn the user that the screen will blank so that he or she doesn't think the computer has locked up.

Smart Loaders

Dan Farnham

Adding a second disk drive can make you a more efficient programmer. But when you have two drives, it's all too easy to access the wrong one. This is especially a problem with loaders—programs that try to load other programs. If I write a loader program that assumes the disk is in a certain drive, I often find that the loader is searching the wrong disk, resulting in a FILE NOT FOUND error.

The solution is to use memory location 186, which holds the device number of the most-recently-accessed device. (This memory location serves the same purpose on both the 64 and the 128.) For example, if you have a program which must perform a few POKEs and then load in a machine language program, your loader might look like this:

```
10 REM POKEs here
20 LOAD "FILENAME",PEEK(186),1
```

A recent example is the program "TurboSave 128" from the April 1987 issue of GAZETTE. I use this loader:

```
10 SCNCLR:PRINT:PRINT"BOOTING
   TURBOSAVE 128"
20 BOOT"TURBOSAVE
   128",U(PEEK(186)),B1
```

All programs listed in this magazine are available on the GAZETTE Disk. Details elsewhere in this issue.

1st In Price, Support, & Warranty

15 Day Free Trial • 90 Day Immediate Replacement Policy • Prices Expire 12-31-87

8½" Letter Size 80 Column Printer

We Liked This Printer So Much, **We Bought Out The Factory!**

Sale $39.95 List $199

*Add $ 7.50 Shipping.

- **Big Blue Dot Matrix Printer**
- **Heat Transfer • Enlarged**
- **Graphics (Apple, Atari, & CBM)**
- **Underline • Upper & Lower Case**
- **True Descenders • Adapters For:**
- **Commodore & Atari . . Sale $19.95**
- **Apple IIc & Laser 128 . Sale $12.95**
- **RS-232 Adapter . . . . . Sale $12.95**
  (Please Specify Male or Female)

Pro 20 Daisy Wheel Printer

Wide Carriage Letter Quality Daisy Wheel Printer

Sale

Sale $99.95 List $499

*Add $10.00 Shipping.

- **Daisy Wheel Printer**
- **18 CPS Shannon & 22 CPS AAA Text**
- **Print Wheel (Courier 10) & Cartridge Compatible with Diablo® & Qume®**
- **Friction Feed • 13" Form Width**

Extra Daisy Wheels . . . . . Sale $ 9.95
Parallel Centronics Interface (IBM®PC, Apple®IIc, Laser 128, CBM . **Sale $19.95**

10" Comstar 1000 Printer

With Near Letter Quality Best Quality In The U.S.A.

Sale $139.95 List $349

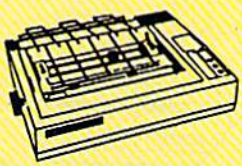
*Add $10.00 Shipping.

- **100 CPS Draft & 20 CPS NLQ**
- **Serial Impact Dot Matrix • Bold**
- **Underline • Condensed • Italics**
- **Pica • Elite • Double Strike**
- **Dot Addressable Graphics**
- **Automatic Paper Loading**
- **Tractor & Friction Feed**
- **Superscript & Subscript**
- **Right & Left Margin Settings**

No One Sells These Printers For Less!

NLQ 180 (180 CPS) Printer

Near Letter Quality
Lifetime Warranty*



Sale $189.95 List $499

*Add $10.00 Shipping.

- **Near Letter Quality Selectable From Front Panel • 8K Buffer**
- **High Speed Dot Matrix**
- **Letter Quality Modes • Italics**
- **Elite • Pica • Condensed**
- **Graphics • Tractor & Friction Feed**
- **Lifetime Warranty on Print Head***
- **6 Month Immediate Replacement Policy For Printer**

Hi-Speed LV-2010 (200 CPS) Printer

High Speed Printing (200 CPS Draft) with Crisp Near Letter Quality

Save

Sale $209.95 List $499

*Add $10.00 Shipping.

- **High Speed 200 CPS Draft**
- **IBM® Compatible • Dot Matrix**
- **Near Letter Quality Printing**
- **Standard Pull Tractor & Automatic Single Sheet Loading**
- **Standard Parallel & Serial Interface Ports**
- **Ultra High Resolution Bit Image Graphics • Continous Underline**

300 CPS Printer

300 CPS Draft - 50 CPS NLQ

Comstar 1300 High Speed Printer With Color Printing Capabilities

Sale $299.95 List $599

*Add $10.00 Shipping.

- **300 CPS Draft - 50 CPS NLQ**
- **Superb Near Letter Quality**
- **Variety Of Characters/Graphics**
- **IBM & Epson Modes • 10K Buffer**
- **Auto Paper Loading & Ejection**
- **Parallel & Serial Interface Ports**
- **Download Character Setting**
- **Front Panel Margin Setting**
- **Optional 7-Color Printing Kit...$99.95**

COMPUTER DIRECT (A Division of **PROTECTO**)
22292 N. Pepper Road, Barrington, IL. 60010
Call (312) 382-5050 To Order
We Love Our Customers!

* Illinois residents add 6½% sales tax. All orders must be in U.S. Dollars. We ship to all points in the U.S., CANADA, PUERTO RICO & APO-FPO. Please call for charges outside continental U.S. or C.O.D. **MAIL ORDERS** enclose cashier check, money order or personal check. Allow 14 days delivery, 2 to 7 for phone orders and 1 day express mail. Prices and availability subject to change without notice. (Monitors only shipped in continental U.S.)

VISA — MASTERCARD — C.O.D.

We Won't Be UNDERSOLD

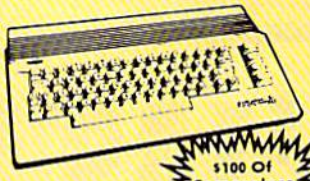
* On items marked *"No One Sells This ----- For Less"*. Copy of valid ad required.

15 Day Free Trial • 90 Day Immediate Replacement Policy • Prices Expire 12-31-87

☆ Commodore Computers, Disk Drives and Compatibles ☆

C64c Computer

Includes GEOS (Word Processor & Versatile Drawing Program) Plus
***5 FREE Programs** From Commodore
Details For Free Programs included with purchase of C64c
Offer Expires 12-31-1987



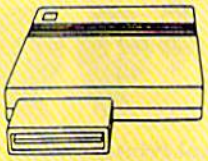
Anti-Static Keyboard Cleaner Sale $9.95

$100 Of Commodore Software *FREE!

Sale Price
$149.95
List $249
(Add $10.00 shipping.*)

256K RAM Expansion

Add 256K Of Extra RAM Memory To Your C64/C64c.
Includes Heavy Duty C64 Power Supply.

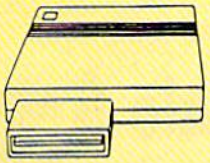


Sale

Sale Price
$119.95
List $149
(Add $3.00 shipping.*)

512 RAM Expansion

Add 512K Of Extra RAM Memory To Your C128/C128D.

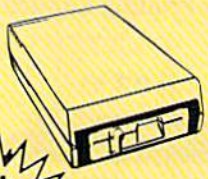


NEW

Sale Price
$139.95
List $259
(Add $3.00 shipping.*)

Excelerator Disk Drive

Commodore Capatible
***Includes FREE Trivia Fever Game**



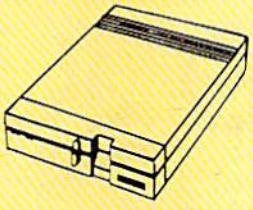
with FREE Trivia Fever Game

Disk Drive Cleaner Sale $9.95

Sale Price
$149.95
List $249
(Add $10.00 shipping.*)

1571 Disk Drive

340K Double-Sided Disk Drive for the C-128 & C128D



Sale Price
$214.95
List $329
(Add $10.00 shipping.*)

800K 3½" Disk Drive

Commodore 1581 Works With C64/C64c, and C128/C128D.
Over 800K Bytes of Formatted Storage On Double-Sided 3.5" Microdiskettes.

NEW

Sale

Sale Price
$179.95
List $249
(Add $10.00 shipping.*)

Call **(312) 382-5050** Mail

We Love Our Customers!

COMPUTER DIRECT
22292 N. Pepper Road
Barrington, IL. 60010

1st In Price, Support, & Warranty

15 Day Free Trial • 90 Day Immediate Replacement Policy • Prices Expire 12-31-87

Complete Commodore 64c System

Sale

$395.95 System Includes:

- **Commodore 64c Computer**
- **Excelerator Plus Disk Drive**
- **Hi-Res 12" Monochrome Monitor** With Connection Cable
- **Big Blue 8½" Printer** With Interface And 2 Rolls Of Paper
- **Geos Program:** Word Processor And Drawing Program

Sale $395.95

(Add $30.00 shipping.*) List $1049

Complete Commodore 128D System

Sale

$549.95 System Includes:

- **Commodore 128D Computer** With Built-In Disk Drive, Detachable Keyboard & 128K Memory Expandable To 640K
- **Hi-Res 12" Monochrome Monitor** With Connection Cable
- **Big Blue 8½" Printer** With Interface And 2 Rolls Of Paper
- **C128D Programmer's Reference Guide**

Sale $549.95

(Add $30.00 shipping.*) List $825

Full Size Piano/Organ Musical Keyboard $49.95**

List $159

(Add $5.00 shipping.*)

SALE SALE

** Conductor Software Required

Keyboard — 40 Keys (A-C) guage spring loaded to give the feel and response of a professional polyphonic keyboard instrument. Plugs right into the joystick port of the Commodore 64 or 128. This sturdy instrument comes with carrying handle, protective key cover and built-in music stand. Size: 29" x 9½" x 4" Weight: 9 lbs.
Registers (with the Conductor Software) — Organ • Trumpet • Flute • Harpsicord • Violin • Cello • Bass • Banjo • Mandolin • Callipoe • Concertino • Bagpipe • Synthesizer 1 & 2 • Clavier 1 & 2 • Can be played over a 7 octave range • Programmable sounds
Recording (with the Conductor Software) — Three track sequencer plus over-dubbing with multiple instruments playing at the same time.

The Music Teacher

List $39.95 **Sale $24.95**

Teaches how to read music and play in rhythm on the keyboard. Features trumpet, organ, violin, synthesizer instrument sounds, built-in metronome, pause-play control and set-up menu for cusomizing. (Disk)

The Conductor Software

List $29.95 **Sale $19.95**

The Conductor Software teaches how a compostition is put together, note by note, instrument by instrument. You will learn to play 35 songs from Bach to Rock. Then you will be ready to compose your own songs! (Disk)

Teaches — Scales • Bass lines • Popular songs "Bolero" to "Thriller".
Features — Control with attack, delay, sustain and release times • Playback tracks while you record • Stores songs on disk • Much more
Requires — Above Keyboard • Commodore 64 or 128 with disk drive

The Printed Song

List $29.95 **Sale $19.95**

Print out your compostition for others to read or play. Requires The Conductor Program and printer compatible with the Commodore graphics mode such as most dot matrix printers with a graphics interface. (Disk)

COMPUTER DIRECT (A Division of **PROTECTO**)
22292 N. Pepper Road, Barrington, IL. 60010
Call (312) 382-5050 To Order
We Love Our Customers!

* Illinois residents add 6½% sales tax. All orders must be in U.S. Dollars. We ship to all points in the U.S., CANADA, PUERTO RICO & APO-FPO. Please call for charges outside continental U.S. or C.O.D. **MAIL ORDERS** enclose cashier check, money order or personal check. Allow 14 days delivery, 2 to 7 for phone orders and 1 day express mail. Prices and availability subject to change without notice. (Monitors only shipped in continental U.S.)

VISA — MASTERCARD — C.O.D.

Power Pause

James Host

Almost everyone will appreciate this handy utility that freezes your computer's operation with the press of a key. You can use it to pause games or halt program listings. Versions for the Commodore 64 and 128.

Whether you are playing a game or simply trying to read text that is speedily scrolling off the screen, pausing the computer's operation can be very useful.

"Power Pause" adds a software-driven pause button to your Commodore 64 or 128. Compatible with BASIC and many machine language programs, Power Pause allows you to freeze the computer's operation by depressing the SHIFT LOCK key and then pressing RESTORE. To resume regular program execution, simply release SHIFT LOCK by pressing it again.

In addition to adding a pause function, Power Pause allows you to set the screen's default text, background, and border colors. These colors are set up when you run Power Pause, and they are retained even after pressing RUN/STOP-RESTORE.

Using The Program

After typing in the appropriate version (Program 1 is for the 64; Program 2 is for the 128), be sure to save a copy. To activate Power Pause, just type RUN. It takes a few seconds to POKE the machine language into memory. When finished, the message POWER PAUSE IS NOW ACTIVE appears on the screen. You can now load and run the program of your choice.

To pause a program, press the SHIFT LOCK key and then press RESTORE. Everything will freeze—graphics, sound, and text. To unfreeze the computer, just unlock the SHIFT LOCK key.

As noted, Power Pause allows you to set BASIC's default screen colors. To do this, you must change three DATA statements in the program. To set the border, background, and text colors, change the numbers found in lines 200, 220, and 240, respectively. These lines are clearly labeled with REMark statements. The number entered must represent one of the standard Commodore colors, 0–15.

Additionally, for programmers experimenting with custom characters or the hi-res screen, Power Pause returns you to the normal text screen whenever a direct-mode command is entered or a SYNTAX ERROR occurs.

The 64 version of Power Pause occupies memory locations $CF00–$CFFF (52992–53247), and wedges into BASIC's operating system through several vectors located in page three. On the 128, Power Pause is stored in bank 0 at $1B00–$1BFF (6912–7167).

See program listings on page 96.

Moving?

For address changes or subscription information, call toll free

1-800-727-6937

Copies of articles from this publication are now available from the UMI Article Clearinghouse.

For more information about the Clearinghouse, please fill out and mail back the coupon below.

UMI Article Clearinghouse

Yes! I would like to know more about UMI Article Clearinghouse. I am interested in electronic ordering through the following system(s):

☐ DIALOG/Dialorder ☐ ITT Dialcom
☐ OnTyme ☐ OCLC ILL Subsystem

☐ Other (please specify)_____
☐ I am interested in sending my order by mail.
☐ Please send me your current catalog and user instructions for the system(s) I checked above.

Name_____
Title_____
Institution/Company_____
_____
Department_____
Address_____
City_____ State_____ Zip_____
Phone (_____)_____

Mail to: University Microfilms International
300 North Zeeb Road, Box 91 Ann Arbor, MI 48106

UTILITIES UNLIMITED, Inc.

12305 N.E. 152nd Street
Brush Prairie, Washington 98606

Orders taken 24 hrs. a day; seven days a week.

Visa, M/C accepted.
If you wish to place your order by phone, please call **206-254-6530**. Add $3.00 shipping & handling on all orders; additional $2.00 for COD.

WE NOW HAVE OVER 1000 PARAMETERS IN STOCK!

Software Submissions Invited
We are looking for HACKER STUFF: parameters, telecommunications, print utilities and the unusual.

Ad copy by RMS Ind., Inc.

SUPER PARAMETERS 500 PAK

At a time when many programmers are cutting back on writing parameters, we are going full steam! After getting several requests for parameters on many of the "oldies but goodies" **WE DID JUST THAT! ANOTHER 1st: 500 DIFFERENT PARAMETERS** all in one pack. And these parameters are not on any of our regular 100 paks. this **FANTASTIC 5-DISK SET** is a value of over $100 for less than 1/2. **$49.95**

SUPER PARAMETERS 100 PAKS: 1 thru 4 ★

. . . **YOU GET 100 OF THE BEST PARAMETERS, ANYWHERE.** Professionally done, easy to use, reliable, fast and full of performance. This package can remove all protection. Includes titles from all major software publishers for the C64/128. **$19.95**

SUPER PARAMETERS 10 PAKS: 1 thru 40 ★

These are the early releases of each 100 pak and we will send you a list on request. **$4.95**

ALL PARAMETERS ARE TOP QUALITY—NO FILLER OR JUNK

PARAMETERS CONSTRUCTION SET

The company that has **THE MOST PARAMETERS** is about to do something **UNBELIEVABLE.** We are giving you more of our secrets. Using this **VERY EASY** program, it will not only **READ, COMPARE** and **WRITE PARAMETERS FOR YOU;** it will also **CUSTOMIZE** the disk with your name. It will impress you as well as your friends. The **"PARAMETER CONSTRUCTION SET"** is like nothing you've ever seen. In fact you can even **READ PARAMETERS** that you may have already written; then by using your construction set rewrite it with your new **CUSTOMIZED MENU. DON'T WAIT** for months for that one special parameter: **WRITE IT!** **$34.95**

REMEMBER FOLKS, YOU SAW IT HERE FIRST!

THE FINAL CARTRIDGE C-64 and C-128

THE #1 SELLING CARTRIDGE IN EUROPE! After reviewing all utilities of this type, including: Icepick, Capture, and super snap shot, we determined that **THE FINAL CARTRIDGE** is just that: **THE LAST CARTRIDGE THAT YOU WILL EVER NEED. EXTENSIVE** programming utilities for both beginner and the hardcore programmer alike. The most impressive utility for **MEMORY-TO-DISK BACKUP** that we have ever seen. We were able to copy almost every program we tried with just the **PRESS OF THE BUTTON.** Now, you may have seen a comparison of **FINAL CARTRIDGE** to super snap shot by a dealer. It is our opinion that they only printed the few items they felt were in its favor **(NOT ACCURATELY)** and failed to list all **THE FAR SUPERIOR FEATURES OF THE FINAL CARTRIDGE.** Come on guys, let's be fair. To get a much better **UNBIASED OPINION**, see great reviews of **FINAL CARTRIDGE** in:

RUN: Sept. 87, pg. 78-80: *"A conventional review doesn't do The Final Cartridge justice—fun at this price is a rarity."*
GAZ: July 87, pg. 44: *"I can't begin to think of a cartridge which does so many useful things."*
AHOY: Nov. 87, pg. 63: *"Overall we were quite pleased."*
INFO: Aug. 87, pg. 33: *"!!A super hacker's cartridge!!"*

READ THEM, THEN YOU DECIDE! ONLY $47.95

SUPER NIBBLERS COMBO! ★

For those who need a really super nibbler copier, for those hard to backup programs, we give you the **★ULTIMATE COPY PROGRAM★** and it will **NIBBLE IN C-64 or C-128 MODE!** This package includes: **100 PARAMETERS** and a **SUPER FAST FILE COPIER. ONLY** **$24.95**

SUPER PARAMETERS—GEOS PAK

This #1 seller will standardize your **GEOS** series utilities to work with anyone else's **GEOS.** Parameters are included for these: **FONTPACK 1, DESKPACK 1, WRITERS WORKSHOP, GEODEX & GEOFILE. THE ORIGINAL STANDARDIZER** for just **$9.95**

THE 128 SUPERCHIP

There is an empty socket inside your 128 just waiting for our **SUPER CHIP** to give you 32k worth of great **BUILT-IN UTILITIES**, all at just the **TOUCH OF A FINGER.** You get built-in features; **FILE COPIER, NIBBLER, TRACK & SECTOR EDITOR, SCREEN DUMP**, and even a 300/1200 baud **TERMINAL PROGRAM** that's 1650, 1670 and Hayes compatible. Best of all it doesn't use up any memory. To use, simply touch a function key, and it responds to your command.

ALSO INCLUDES 50 parameters—**FREE!**

All this for **$29.95**

ADULT GAME & GRAPHICS DATA DISKS

GAME: A very unusual game to be played by a very **OPEN MINDED** adult. It includes a **CASINO** and **HOUSE OF ILL REPUTE.** Please, you **MUST BE 18** to order **EITHER ONE.**
DATA ★: This **POPULAR** disk works with **PRINT SHOP** and **PRINT MASTER.**

$24.95 ea.

CLOSE-OUT OF MegaSoft #1 SELLERS — PRICED TO MOVE —

64 BBS: for 1 or 2 drives	$19.95
64 MODEM prg.: w/wargames auto dialer	$14.95
N-CODER & D-CODER: together for only	$14.95
GRAPHIC LABEL MAKER: the original	$12.95
D-COMPILER: for the famous BLITZ!	$14.95
PHOTO COPY: reviewed in RUN magazine	$12.95
MSD SHURE COPY: make your MSD hum	$14.95

— OTHER SPECIALS —

HEAVY DUTY REPAIRABLE 64 POWER SUPPLIES Most expensive C64 repairs are due to a faulty power supply. Don't wait; replace yours now!!	$39.95
CLOSE-OUT OF KRACKER-JAX 64 RESET BOARDS	$3.95
DISK NOTCHERS: double disk capacity	$4.95
SECURITY KEYS: lost your dongle? (For golf or bowling games)	$3.95

LOCK PIK—THE BOOKS—for the C64 and C128

Lock Pik 64/128 was put together by our crack team, as a tool for those who have a desire to see the **INTERNAL WORKINGS** of a parameter. The books give you **STEP-BY-STEP INSTRUCTIONS** on breaking protection for backup of 100 popular program titles. Uses **HESMON** and **SUPEREDIT.** Instructions are so clear and precise that anyone can use it. **★OUR BOOK TWO IS NOW AVAILABLE★**

BOOK 1: Includes Hesmon and a disk with many utilities such as: **KERNAL SAVE, I/O SAVE, DISK LOG FILE** and lots more, all with instructions on disk. A long-time favorite of many.

BOOK 2: 100 NEW PARAMETERS, Hesmon on disk, and more utilities to include: **A GENERAL OVERVIEW ON HOW TO MAKE PARAMETERS** and a **DISK SCANNER.**

$29.95 each OR BUY BOTH FOR **ONLY $49.95**

C-64 and C-128 BURST ROM CHIPS

Lets your C-64 run in **"BURST MODE"** when using a 1571 or 1581 disk drive. Loads 100 blks in 6 sec. (1571) and 4 sec. (1581). Features: fast directory, **SEQ.** and **REL.** file access and built-in **DOS WEDGE.** Simple installation Kernal ROM U4 must be socketed. C-128 version has same features as above. For use in 64 mode.

C-64 **$29.95** C-128 **$35.95**

★ = AN IBM and ST VERSION IS ALSO AVAILABLE

Instant 80

True 80-Column Preview For *SpeedScript*

Glen Mackinnon

Add a fast 80-column preview option to SpeedScript 64 *(versions 3.0 or higher). With a couple of keypresses, you can see exactly how your document looks prior to printing.*

Unless you use *SpeedScript* with a 40-column printer, getting a word processing file to look "just right" can mean a lot of wasted paper: The last word in a paragraph appears on a page by itself, one-page letters take up two pages, and seemingly organized columns of information come out jumbled. "Instant 80" provides an 80-column solution to this 40-column problem.

Instant 80 allows you to see, onscreen, precisely what will be printed on paper. Instant 80 merges with *SpeedScript*, creating a modified *SpeedScript* program with 80-column previewing capabilities. The only tradeoff for this enhancement is that it reduces *SpeedScript*'s text area by 1.5K, leaving you with 41K to work with. In real terms, this means that your total work space is reduced by slightly more than a page of text.

Getting Started

Note that Instant 80 is not a standalone program. You must have a copy of *SpeedScript*, version 3.0 or higher.

Instant 80 is a 450-byte machine language program. Type it in using the "MLX" machine language entry program found elsewhere in this issue. When prompted for the starting and ending addresses, enter the following:

Starting address: 2500
Ending address: 26C7

When you are finished typing, save it to tape or disk with the name INSTANT 80. To combine Instant 80 with *SpeedScript*, follow these instructions:

1. **LOAD "SPEEDSCRIPT",8** (for disk) or **LOAD "SPEEDSCRIPT"** (for tape).
2. **LOAD "INSTANT 80",8,1** (for disk) or **LOAD "INSTANT 80",1,1** (for tape).
3. Type **POKE 2062,0:POKE 2063,37**.
4. **SAVE "SPEEDSCRIPT/80",8** (for disk) or **SAVE "SPEEDSCRIPT/80"** (for tape).

You now have a copy of *SpeedScript* with Instant 80 permanently installed. To use this modified version, load and run SPEEDSCRIPT/80 as you would any BASIC program.

Previewing In 80-Columns

To use Instant 80, press CTRL–SHIFT–P, followed by S. This is the command sequence to direct *SpeedScript*'s output to the screen. Instead of the usual 40-column output, Instant 80 provides a *true* 80-column view of your file. The text displayed is distinguishable on a normal color television, better on a black-and-white television, and quite clear on a monitor such as the 1702.

To freeze the scrolling text, press SHIFT or SHIFT LOCK. Release the SHIFT or SHIFT LOCK key to continue 80-column output. After the entire document has listed to the screen, press any key to return to *SpeedScript*. If you wish to halt the listing sooner, press RUN/STOP. Note that pressing the RESTORE key while the document is listing to the screen will cause the program to crash.

How It Works

Instant 80 uses the 64's high-resolution screen to generate 80-column text. Letters are created using 4 × 8–pixel bitmapped characters. This produces characters that are the same in height but half as wide as the 64's normal characters.

By default, Instant 80 produces brown characters on a gray screen. If you prefer different colors, you can modify the program. To change the colors, load SPEEDSCRIPT/80 and execute the following POKE before running the program:

POKE 9562, *background* + *character* * 16

where *background* and *character* are the background and character colors (numbered 0–15), respectively. To make this change permanent, save your newly modified version of SPEEDSCRIPT/80 to tape or disk with a new name before running the program.

See program listing on page 97.

Take command of your computer system

Consolidate your 64, 64C or 128 system with the Command Center:

Just look at all it includes:

- **Built-in AC Power Strip** with power surge and voltage spike protection, line noise filtering and power outlets.
- **Built-in Drive/CPU Cooling Fan** to prevent overheating.
- **Modular Telephone Plug** with its own on-line/off-line telecommunications switch. (Optional on 64 and 64C).
- **Master AC Switch** for easy system power up.
- **Single or Dual Drive Configurations** with the standard drive insert.

☐ 64..... $119.95

☐ 128.....$149.95

☐ 64C..... $129.95

COMMAND CENTER ACCESSORIES

(Specify 128, 64, or 64C when ordering)

Dust Cover $19.95 — covers entire system

Keyboard Cover $19.95 — smoked acrylic

Drive Reset $14.95 — one switch per drive

Short Serial Cable $9.95 — for chaining drives

Modem Switch $9.95 — 64/64C option

Tilt/Swivel Monitor Stand $14.95 — see below

Cartridge Port Extension Board — $24.95

The Command Center will untangle your system.

(Call for details)

"Sound Trap" acoustic enclosure

NEW

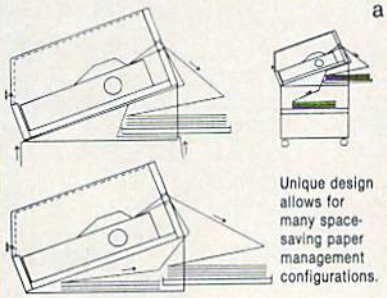
We offer the **total solution** to complete your "office at home" for the **special introductory price of only** **$99.95**

- Fits all popular 80 column printers, 132 column also available
- Sturdy wood construction
- Sound absorbing foam lining reduces printer noise up to 90%
- Tilted for easy printer viewing
- Attractive woodgrain finish compliments any surroundings
- Clear acrylic lid keeps sound in and dust out

Dimensions:
Inside 20½"W x 16"D x 6¼"H
Outside 22½"W x 18"D x 15½"H

- Unique slide-out shelf catches printout, eliminating the need for a costly catch-basket

Compare to other enclosures of similar quality and dimensions costing at least $139.95! That doesn't include "extras" like a catch-basket and a stand to raise the enclosure which are already incorporated into our design!



Unique design allows for many space-saving paper management configurations.

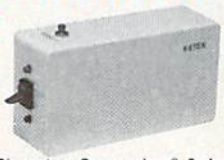
Cramped for extra space? Our optional cart is specially designed for use with the "Sound Trap". It has the same quality wood construction and casters for mobility. **$149.95**

Shipping/Handling:
Sound Trap $12.00
Cart $19.00

Cart Dimensions: 24¼"W x 18"D x 25"H

The "Sound Trap" is available with an optional fan to dissipate heat build-up. Integrated AC outlet and master power switch activates both printer and fan. **$49.95**

Data Director



$39.95

- Eliminates cable swapping.
- Saves wear on disk drive serial ports.
- Share two Commodore® 6-pin serial devices with one computer.
- Works with Commodore® compatible disk drives, printers, and all interfaces.
- LED indicates which device is in use.
- Convenient button resets device.

Remote Power Controller

$129.95

Compare to others costing $199.95!

- 6-foot power cord
- Panel mounted fuse

Controller: 3¼" x 5¾" x 1¼"
Base Unit: 5¼" x 5¾" x 2¼"

- Convenient push-button switches with power indicators for separate control of up to 5 devices
- For computers, monitors, printers, disk drives, etc.
- Five 120 V outlets provide 3-way protection against surges and spikes
- High-impact plastic base unit and controller are colored to compliment any system and are separated by a 6-foot cable for ease of placement
- Base unit mounts behind/under desk to keep your work area clear of unsightly cables
- In/out telephone jacks protect valuable communications equipment against phone line surges

Shipping and Handling

Continental U.S.
$ 4.50 for each Command Center
$ 2.00 for one accessory item
$ 3.00 for two or more accessories

APO/FPO/Canada/Puerto Rico/ Hawaii/Alaska
$13.00 for each Command Center
$ 4.00 for one accessory item
$ 6.00 for two or more accessories

® Commodore is a registered trademark of Commodore Electronics, Ltd.

KETEK

P.O. Box 203
Oakdale, IA 52319

$2.00 charge for C.O.D. orders
Iowa residents add 4% sales tax

Free 30-day trial offer and one-year warranty.

For faster service, call
1-800-626-4582 toll-free
1-319-338-7123 (Iowa Residents)

MasterCard VISA

DEALER INQUIRIES INVITED

Name

Address

City State Zip

Phone Number

S & S Wholesalers, Inc.

FREE FREIGHT ON ORDERS OVER $100.00.

ALL PRICES REFLECT A 3% CASH DISCOUNT. ADD 3% FOR CREDIT CARD PURCHASES. COD ORDERS ADD $4.00 PER BOX. ORDERS UNDER $100.00 ADD $4.00 SHIPPING AND HANDLING. QUANTITIES ON SOME ITEMS MAY BE LIMITED. PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE. APO. FPO ADD 6% ADDITIONAL SHIPPING. FOREIGN ORDERS ACTUAL FREIGHT CHARGED. ALL SALES ARE FINAL. RETURN OF DEFFECTIVE MERCHANDISE FOR REPLACEMENT ONLY WITH AUTHORIZATION. AUTHORIZED RETURNS ARE SUBJECT TO A RESTOCKING FEE. COMPLETE LISTING OF ALL SALES POLICIES AVAILABLE UPON REQUEST.

*EXCEPT ON ITEMS MARKED BY AN ASTERIKS.

CHRISTMAS HOURS: 8:00 AM - 9:00 PM EST

COMMODORE

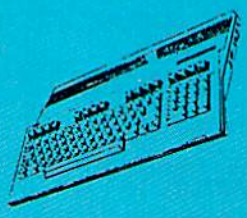
1571 DISK DRIVE	239.90
MPS 1200 PRINTER	229.90
C1902A MONITOR	279.90
128D COMPUTER	489.90
64C COMPUTER	CALL
1541 DISK DRIVE	179.90
C1700 EXPANDER	109.90
C1750 EXPANDER	159.90
C1660 MODEM	39.90
C1670 MODEM	CALL
C2002 MONITOR	329.90
C1581 DRIVE	239.90
C1351 MOUSE	34.90
DPM1101 DAISY WHEEL	249.90

C64 WORD PROCESSING SYSTEM

C64 COMPUTER
1541C COMPATIBLE DRIVE
80 COLUMN PRINTER
WORD PROCESSOR
DATA BASE

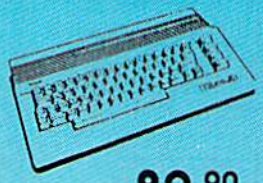
399.90
— FREE SHIPPING —

COMMODORE 128



189.90.
*WITH DISK DRIVE PURCHASE

COMMODORE 64



89.90.
*WITH PURCHASE OF SOFTWARE PACKAGE

MPS803 PRINTER

109.90.
— QUANTITIES LIMITED —
*WITH 2 RIBBON PURCHASE

PANASONIC 1080i

139.90*
WITH PURCHASE OF STARTER PACK

C1750 EXPANDER

159.90

64 SOFTWARE

ACCOLADE

ACE OF ACES	17.97
DAMBUSTERS	17.97
DECEPTOR	8.97
DESERT FOX	8.97
FIGHT NIGHT	17.97
FOURTH AND INCHES	17.97
HARDBALL	17.97
KILLED UNTIL DEAD	17.97
LAW OF THE WEST	17.97
SPY VS SPY I & II	8.97

ACTIONSOFT

THUNDER CHOPPER	17.97
UKP PERRISCOPE	17.97

ABACUS

ASSEBLER MONITOR	23.97
BASIC COMPILER	23.97
CADPAK	23.97
CHARTPLOT	50.97
COBOL C64	23.97
DATAMAT	23.97
FORTH LANGUAGE	23.97
POWER PLAN C64	23.97
QUICKCOPY C64	11.97
SUPER C	35.97
SUKPER PASCAL	35.97
TAS C64	35.97
VIDEO BASIC	23.97
XPER EXPERT SYSTEM	35.97

PROGRESSIVE PERIPHERALS

BOB TERM PRO	29.97
PICASSO'S REVENGE	35.97
SUPER SCRIPT	29.97
SUPERBASE '64	47.97
VISIWRITE	41.97

ACCESS

EXECUTIVE DISK-LEADER BD	11.97
LEADER BOARD	23.97
MACH 128	29.97
MACH 5	20.97
TOURNAMENT DISK-LEADER BD	11.97
TRIPLE PACK	11.97
WORLD CLASS LEADER BD	23.97
WLD CL FAMOUS COURSES 1	11.97
10TH FRAME BOWLING	23.97

ARTWORX

BRIDGE 4.0	14.97
COMPUBRIDGE	14.97
INTERNAT'L HOCKEY	14.97
PRO BOXING	8.97
STRIP POKER	17.97
STRIP POKER DISK 1 FEMALE	11.97
THAI BOXING	8.97

ATARI

BATTLEZONE	8.97
CENTIPEDE	8.97
DEFENDER	12.97
GALAXIAN	8.97
GREMLINS	8.97
JUNGLE HUNT	8.97
MOON PATROL	8.97
MS PAC MAN	8.97
PAC MAN	8.97
POLE POSITION	8.97
TRACK AND FIELD	8.97

AVALON HILL

BLACK THUNDER	12.00
COMPUTER FOOTBALL STRAT	12.00
COMP STATIS PRO BASEBALL	21.00
DR. RUTH'S GAME/GOOD SEX	17.97
DREADNOUGHTS	18.00
GULF STRIKE	18.00
JUPITER MISSION 1999	21.00
LONDON BLITZ	15.00
MACBETH	15.00
MISSION ON THUNDERHEAD	15.00
PANZERS EAST	18.00
SPITFIRE 40	21.00
SUPER BOWL SUNDAY	21.00
TOURNAMENT GOLF	18.00

BATTERIES INCLUDED

CONSULTANT	35.97
HOME PAK	9.97
PAPERCLIP	23.97
PAPERCLIP W/SPELLPACK	37.77

SOFTWORKS

DESK PACK II	29.97
GEOCALC	29.97
GEOCHART	23.97
GEODEX	23.97
GEOFILE	29.97
GEOPUBLISH	29.97
GEOS	35.97
GEOS DEST PACK I	20.97

BETTERWORKING

BUSINESS FORM SHOP	23.97
FILE PRO	17.97
POWER ASSEMBLER	23.97
POWER C	23.97
PROGRAMMERS TOOL BOX	11.97
SPREADSHEET	17.97
TURBO-LOAD TURBO-SAVE	14.97
WORD PRO	23.97
WORD PROC W/SPELL CHECK	17.97

BRODERBUND

BANK STREET WRITER	29.97
BANK STREET SPELLER	29.97
BANK STREET FILER	29.97
BANK STREET MAILER	29.97
CHAMP LODE RUNNER	20.97
HOLIDAY PRINT SHOP GRAPH	14.97
KARATEKA	17.97
PRINT SHOP	26.97
PRINT SHOP COMPANION	20.97
PRINT SHOP GRAPHICS LIB 1	14.97
PRINT SHOP GRAPHICS LIB 2	14.97
PRINT SHOP GRAPHICS LIB 3	14.97
TYPE	23.97
WHERE IN THE USA IS CARMEN	26.97
WHERE IN WORLD IS CARMEN	20.97

ELECTRONIC ARTS

ADVENTURE CONST. SET	24.97
AMNESIA	24.97
ARCTIC FOX	20.97
AUTODUEL	30.97
BARD'S TALE	24.97
BARD'S TALE II	24.97
CHESSMASTER 2000	24.97
FINANCIAL COOKBOOK	9.00
HARD HAT MACK	6.00
LEGACY OF THE ANCIENTS	18.97
M.U.L.E.	9.00
MAIL ORDER MONSTERS	9.00
MARBLE MADNESS	18.97
MOVIE MAKER	9.00
MUSIC CONST. SET	4.00
OGRE	24.97
PEGASUS	18.97
PINBALL CONST. SET	9.00
RACING DESTRUCTION SET	0.00

EDUWARE

ALGEBRA VOLUME I	17.97
ALGEBRA VOLUME II	17.97
ALGEBRA VOLUME III	17.97
EDUWARE BUNDLE	53.91
SPELLING AND READING	17.97
WEBSTER'S NUMBERS	17.97

EPYX

CHAMPIONSHUP WRESTLING	23.97
CREATE A CALENDAR	17.97
DESTROYER	23.97
GRAPHICS SCRAPBK SPORTS	14.97
GRAPHICS SCRAPBK OFF WALL	14.97
GRAPHICS SCRAPBK SCHOOL	14.97
JET COMBAT SIMULATOR	11.97
MICROSOFT MULTIPLAN	23.97
PROGRAMS BASIC TOOLKIT	11.97
STREET SPORTS/BASEBALL	23.97
STREET SPORTS/BASKETBALL	23.97
SUB BATTLE	23.97
SUMMER GAMES II	23.97
VORPAL UTILITY KIT	11.97
WINTER GAMES	23.97
WORLD GAMES	23.97
WORLD KARATE CHAMP	17.97
CALIFORNIA GAMES	23.97

FIREBIRD

COLOSSUS CHESS IV	20.97
ELITE	19.97
GUILD OF THIEVES	26.97
PAWN	26.97
STARGLIDER	23.97

GAMESTAR

CHAMP BASEBALL	17.97
GBA CHAMP BASKETBALL	20.97
GFL CHAMP FOOTBALL	20.97
ON FIELD FOOTBALL	17.97
ON TRACK RACING	14.97
STAR LEAGUE BASEBALL	17.97
STAR RANK BOXING	17.97

HAYDEN

MICRO ADDITION	7.77
SARGON III	14.77

HITECH EXPRESSIONS

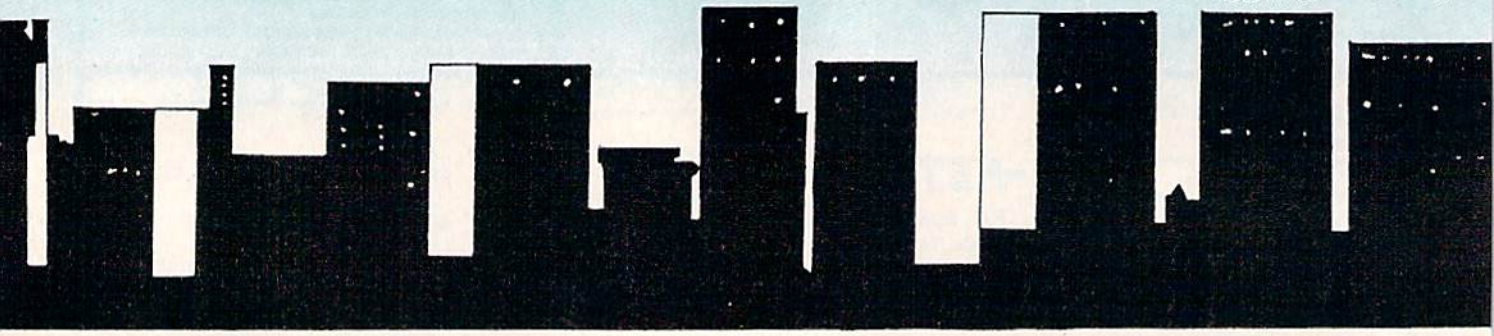
CARDWARE	6.77
CHRISTMAS JINGLE DISK	6.77
HEART WARE	6.77
PARTYWARE	9.77

INFOCOM

DEADLINE	6.77
LEATHER GODDESES/PHOBOS	20.97
STARCROSS	6.77
SUSPENDED	6.77
ZORK I	6.77
ZORK II	6.77
ZORK III	6.77
ZORK TRILOGY	14.77

DAVIDSON

ALGE-BLASTER	29.97
MATH BLASTER	29.97
SPELL IT!	29.97
WORD ATTACK	29.97



1-800-233-6345 1-800-331-7054

PANASONIC

1080I	CALL
1091I	199.90
1092I	329.90
KXP3131 DAISY WHEEL	249.90
1524 24 PIN HEAD	CALL
LASER PRINTER	1499.90

EPSON

LX800	169.90
FX86E	349.90
FX286E	449.90
EX800	CALL
EX1000	CALL
LQ800	589.90
LQ1000	CALL
LQ2500	899.90

C64 SYSTEM

C64 COMPUTER
1541 COMPATIBLE DRIVE
CITIZEN 40 COLUMN PRINTER
JOYSTICK

399.90

— FREE SHIPPING —

AMIGA

AUTHORIZED AMIGA DEALER
COMPLETE AMIGA LINES IN STOCK
CALL FOR BEST PRICES

C128 SUPER WORD PROCESSING SYSTEM
C128 COMPUTER
C1571 DISK DRIVE
C1902A MONITOR
MPS 1200 PRINTER
WORD PROCESSING WITH WORD CHECKER

FREE SHIPPING 999.90

AMERICAN COVERS

C128 COVERS	7.77
C64 COVERS	6.77
1571 COVERS	7.77
C1902 COVERS	14.77
MPS803 COVERS	7.77
MPS1200	9.77
MPA1000	9.77
VIC1525	9.77
AMIGA SYSTEM	29.90
A1080 COVER	14.77
AMIGA DRIVE	9.77
C1802 COVER	14.77
C1702 COVER	14.77
OKIMATE	9.77
SEIKOSHA	9.77
IPSON	9.77
EPSON 15"	12.77

OTHERS AVAILABLE
CALL FOR PRICING

RADAR DETECTOR

SUPERHETRODYNE

69.90

STAR NX10C

199.90

WICO

BOSS	11.77
BAT	14.77
BLACKMAX	8.77
THREE WAY	19.77

PROFESSIONAL SOFTWARE

FLEET FILER	23.97
FLEET SYSTEM 2	35.97

STRATEGIC SIMULATIONS

FORTRESS	8.97
GEMSTONE WARRIOR	8.97
GERMANY 1985	8.97
GETTYSBURG	35.97
KAMPFGRUPPE	35.97
NORWAY 1985	20.97
PANZER GRENADIER	23.97
PHANTASIE II	23.97
PRESIDENT ELECT '88	14.97
REBEL CHG: CHICKAMAUGA	29.97
ROADWAR 2000	23.97
SIX GUN SHOOTOUT	23.97
USAAF	35.97
WAR IN THE SO. PACIFIC	35.97
WARGAME CONST. SET	17.97
WARSHIP	35.97

MASTERTRONIC

ACTION BIKER	4.77
BMX RACERS	4.77
CHILLER	4.77
ELEKTRA GLIDE	4.77
FINDERS KEEPERS	4.77
FIVE A SIDE SOCCER	4.77
GATES OF DAWN	4.77
HERO OF GOLDEN TALISMAN	4.77
INSTANT RECALL	4.77
KIKSTART	4.77
LAST V8	4.77
MASTER MAGIC	4.77
NINJA	4.77
PRO-GOLF	4.77
SEKAA OF ASSIAH	4.77
SLUGGER	4.77
SPACEHUNTER	4.77
SPEED KING	4.77
SPOOKS	4.77
VEGAS POKER AND JACKPOT	4.77
ZZZ	4.77

MICROPROSE

ACROJET	14.97
CONFLICT IN VIETNAM	23.97
F-15 STRIKE EAGLE	20.97
GUNSHIP	20.97
SOLOFLIGHT	14.97
PIRATES!	23.97
SILENT SERVICE	20.97
TOP GUNNER SERIES	14.97

MICRO LEAGUE

MICROLEAGUE BASEBALL	23.97
WWF MICROLEAG WRESTLING	23.97
1986 TEAMS DISK	11.97
50's WORLD SERIES	11.97
60's WORLD SERIES	11.97
70's WORLD SERIES	11.97

PEACHTREE

BACK TO BASIC ACCNTING	117.00

THUNDER MOUNTAIN

ABC'S W/ THE TINK TONKS	5.97
CYRUSS CHESS	5.97
DEMOLITION MISSION	5.97
ELIMINATOR	5.97
MAXI GOLF	5.97
MR. PIXEL'S CARTOON KIT	5.97
NUMBER BOWLING	5.97
RAMBO FIRST BLOOD PT. II	5.97
SONGWRITER	5.97
SUBTRACTION W/TINK TONKS	5.97
TOP GUN	5.97

TIMEWORKS

DATA MANAGER 2	23.97
PARTNER	35.97
SWIFTCALC W/SIDEWAYS	23.97
WORD WRITER 3	29.97

UNISON WORLD INC.

ART GALLERY I	14.97
ART GALLERY II	14.97
PRINT MASTER PLUS	20.97

SPRINGBOARD

CERTIFICATE MAKER	29.97
CERT. MAKER LIBRARY 1	20.97
CLIP ART VOL 1	17.97
CLIP ART VOL 2	23.97
CLIP ART VOL 3	17.97
EARLY GAMES FOR CHILDREN	20.97
GRAPHICS EXPANDER	20.97
NEWSROOM	29.97

SUBLOGIC

BASEBALL	32.47
BASEBALL STADIUM DISK	12.97
FLIGHT SIMULATOR II	32.47
FOOTBALL	25.97
JET	25.97
NIGHT MISSION PINBALL	19.47
SCENERY KISK 1 TEXAS	12.97
SCENERY DISK 2 ARIZONA	12.97
SCENERY DISK 3 CALIF., NEV.	12.97
SCENERY DISK 4 WASHINGTON	12.97
SCENERY DISK 5 UTAH, CO, WY	12.97
SCENERY DISK 6 KANSAN, NEB.	12.97
SCENERY DISK 7 FL, NC, SC	12.97
SCENERY DISK 9 IL, MO, OH	12.97
STAR SCENERY-SAN FRAN	12.97
STAR SCENERY-JAPAN	12.97
WESTERN SCENERY DISK PACK	64.97

MINDSCAPE

BOP'N WRESTLE	17.97
DEFENDER OF THE CROWN	20.97
FIST	17.97
HIGH ROLLER	17.97
INFILTRATOR	17.97
MASTERTYPE	11.97

DIGITAL SOLUTIONS

POCKET DICTIONARY	8.97
POCKET FILER II	35.97
POCKET PLANNER II	35.97
POCKET WRITER II	35.97

128 SOFTWARE

ABACUS

BASIC COMPILER	35.97
CADPAK	35.97
CHARTPAK	23.97
COBOL	35.97
PERSONAL PORTFOLIO MGR	35.97
SPEEDTERM	23.97
SUPER C	35.97
SUPER PASCAL	35.97
TAS	35.97
XREF	10.77

ACCESS

MACH 128	29.97

BATTERIES INCLUDED

PAPERCLIP II	47.97

DIGITAL SOLUTIONS

POCKET DICTIONARY	8.97
POCKET FILER	30.00
POCKET FILER II	35.97
POCKET PLANNER II	35.97
POCKET WRITER II	35.97
SUPERPACK II	59.97

PROGRESSIVE PERIPHERILS

BOB TERM PRO	47.97
SUPER SCRIPT	47.97
SUPERBASE 128	59.97
VISISTAR 128K	71.97

PROFESSIONAL SOFTWARE

FLEET SYSTEM 3	41.97
FLEET SYSTEM 4	47.97

TIMEWORKS

DATA MANAGER 128	34.77
PARTNER	34.77
SWIFTCALC 128	34.77
SYLVIA PORTER 128	34.77
WORD WRITER 128	34.77

XETEC

FONTMASTER 128	35.97

DIABLO 630

400CPS PRINTER

799.90

AMIGA

CALL FOR BEST PRICING

OKIMATE COLOR PRINTER

99.90

*WITH PURCHASE OF PLUG-N-PRINT

PC10-1

489.90

*WITH MONITOR PURCHASE

C64 POWER SUPPLY

28.90

— FREIGHT FREE —

SIX OUTLET SURGE PROTECTOR

19.90

C1670 MODEM

129.90

*WITH PURCHASE OF SOFTWARE

COLOR MONITOR

— QUANTITIES LIMITED —
*WITH PURCHASE OF MONITOR CABLE

COMMODORE COMPUTERS

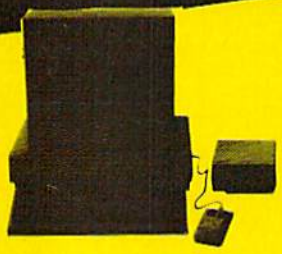
*64 $99

64C - $159

*C128 $228

C128D...*$499

*(WITH PURCHASE OF EXTENDED WARRANTY)



AMIGA 500

PLEASE CALL FOR LATEST PRICING

**$598

IBM PC-10-2

**WITH PURCHASE OF MONITOR

DISK DRIVES

1541

$138*

*(WITH PURCHASE OF EXTENDED WARRANTY)

FSD-2 ..... $159
1541C $169
1571 ..... $248

MODEMS

300 BAUD FOR YOUR COMMODORE

$28

COMMODORE 1670 300/200

$139

TRANSCOM

- SPEAKER BUILT-IN
- VOLUME CONTROL

$138

MONITORS

COLOR COMPOSITE

$158

1902A *$229
MONOCHROME..... *$ 79

(WITH PURCHASE OF EXTENDED WARRANTY)

RAM EXPANSION

FOR YOUR COMMODORE

C64 1764

$138

C128 1750

$188

AMIGA 100

EXPANSION MODULE

$98

POWER SUPPLY

$29 $69

C-64 C-128

SURGE PROTECTOR

$14.95

Protect your computer from lightning

DATA SET

$28

For 64, PLUS 4

MOUSE

$34.95

- Pull down menu
- Load directory
- Scratch
- Browse File
- Adjustable File

VOICE MASTER

$79

64/128

JOY STICK

$9.95

When buying 2 Joy Sticks with suction cups

C-64, Plus 4, 128

DISKETTES

39¢ ea.

In lots of 100 with purchase of Floppy Disk File

DISK FILER

$9.95

CALL PRO-TECH-TRONICS TODAY!

QUICK-DELIVERY

215 W. Main Street
New Prague, MN 56071
(612) 758-6268

OPEN 7 DAYS A WEEK & EVENINGS

1-800-345-5080

COMPUTE! Publications

Presents the

NAME YOUR DREAM SWEEPSTAKES!!!

Now's the chance to win the personal computer system of your dreams!!

A $5,000 state-of-the-art powerhouse computer, loaded with the latest peripherals and a collection of software!

Take home an amazing new Amiga 2000 multitasking computer,
capable of producing stunning stereo sound and superb color graphics
as well as running all IBM PC software!

OR

Choose a new Apple Macintosh SE computer,
the expanded, faster Mac capable of reading IBM PC software,
and a leader in the growing desktop publishing world!

OR

Receive a powerful Atari 1040ST computer system,
complete with laser printer, a terrific combination of processing power, super color graphics,
and MIDI-equipped sound output!

OR

Pick up a new IBM Personal System 50,
the 80286-based computer system with twice the computing speed of an IBM PC-AT
and new VGA graphics power!

Each of these one-megabyte dream machines comes with an appropriate mix of hard disk drive
and/or 3-1/2-inch and 5-1/4-inch floppy drives, monitor, printer, a modem for telecommunications,
and a collection of popular software programs to get you started.

OR

Put together your own custom dream computer system with $5,000.00 in cash!

Enter today!!

1. No purchase necessary. To enter, complete the official entry form or, on a plain piece of paper, hand print your name, address, city, state, and zip code. Enter as often as you wish, but mail each entry separately to: Name Your Dream Sweepstakes, P.O. Box 537, Lowell, IN 46399. All entries must be received by July 1, 1988. Not responsible for late, lost or misdirected mail.

2. Winner will be determined in a random drawing on or before July 15, 1988, by Ventura Associates, Inc., an independent judging organization whose decisions are final. The prize is guaranteed to be awarded. Winner will be notified by mail and may be required to complete an affidavit of eligibility which must be returned within 21 days of date on notification. No substitutions for prize except as may be necessary due to availability. All taxes are the responsibility of the winner. Entry constitutes permission to use of winner's name and likeness for publicity purposes without additional compensation.

3. Approximate retail value of the prize is as follows: Grand ($5,000.00).

4. Odds of winning are determined by the total number of entries received. Sweepstakes open to residents of the United States. Employees and their families of Capital Cities/ABC, Inc., its affiliates, subsidiaries, distributors, retailers, advertising and production agencies, and Ventura Associates, Inc., are not eligible. All federal, state, and local rules and regulations apply. Void where prohibited.

5. For the name of the major prize winner, send a stamped, self-addressed envelope before July 1, 1988 to: Name Your Dream Sweepstakes Winners, P.O. Box 773, Lowell, IN 46399.

Customize Your 128's CP/M Keyboard

James Adams

If you've ever wished you could put one of your computer's keys where another is or have one key do the job of a half-dozen, then KEYFIG, the keyboard redefinition program that comes on the 128's CP/M disk, is just what you're looking for. With KEYFIG, you can personalize your keyboard just the way you want it.

Imagine being able to have any key on your 128's CP/M keyboard return any value you want. You could assign a key either a single character—put the ESCape key's value at F1, for example—or a string—have @ print your name, address, and phone number any time you press it. KEYFIG, the keyboard reconfiguration utility included on the 128's CP/M disk, can work this bit of magic for you.

Meet KEYFIG

KEYFIG, or the C128 Soft Keyboard Program, is a menu-driven utility that allows you to redefine most of the computer's keys. (There are a few keys that KEYFIG will not allow you to change: SHIFT, SHIFT LOCK, CONTROL, Commodore, CAPS LOCK, and the 40/80 DISPLAY key.)

Let's walk through the modification of some function keys. We'll use the up and down arrows (on the top row of the keyboard) and the RETURN key (not ENTER—the two have different values in KEYFIG) to make menu selections.

Suppose we wanted to modify the function key F1 to return the sequence DIR and F2 to give us the more complete directory listing using DIR[FULL,USER=ALL].

DIR is a built-in, or resident, directory command that will list all the files on the current drive and user area. It is always available and requires no additional program file on disk to run. The use of the [FULL, USER=ALL] options require that DIR.COM be on the disk in the current drive. It will list each file on the disk in any user area and also display time, date, and read-write protection information.

Before using KEYFIG, you'll need to load the CP/M operating system from disk. You can do this by placing a CP/M system disk in the drive and either turning the computer on or typing BOOT from BASIC 7.0. When you see the A> system prompt, simply type KEYFIG, and you're ready to begin.

The first question that KEYFIG asks is "Do you want help?" The help information is called from the file KEYFIG.HLP on the system disk. The only problem with these instructions is that they can be accessed only when KEYFIG is first run. If you answer N to the prompt, you will not be able to return to the instructions later. If you get stuck and need help in the middle of a session, you will have to exit KEYFIG with CONTROL-C and start again.

There is a solution to this problem, however. You can print the help file and use it as a reference until you become familiar with KEYFIG. Do this by pressing CONTROL-P to send everything that appears on the screen to the printer. Next, enter TYPE KEYFIG.HLP at the A> prompt. The file will take four, 40-column pages to print.

After the instructions, KEYFIG needs to know where you want to begin your work: Do you want to modify the default definitions, the definitions on the CP/M boot disk, or the current definitions (those currently in memory)? If this is the first time you have used KEYFIG, all three of these areas will contain the same key definitions and assignments. If you have modified several versions of CP/M+, then each location may contain different sets of configurations. Press the highlighted choice to select the default definitions.

KEYFIG now gives you a menu of three choices:

Edit a Key Definition
Set up Logical/Physical Colors
Exit and Save your Work File

Since we want to edit a key and this option is already highlighted, press RETURN to go to the next menu. Initially, half of this menu is blank since no key has been selected. Pressing any key will fill in the rest of the menu.

Modifying A Key

Each key returns four possible values: the normal (unshifted) value, the SHIFTed value (the value returned when the key is pressed along with the SHIFT key), the CONTROL value, and the Commodore value.

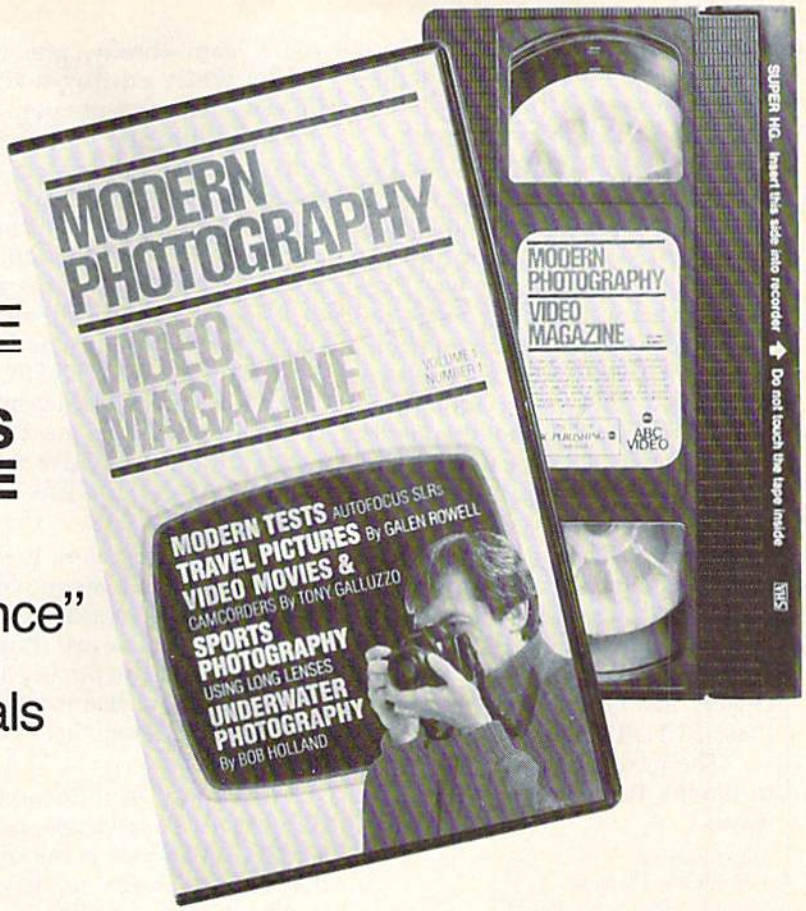
At first, it may seem that you cannot modify the RETURN key or the up- and down-arrow keys on the top row of the keyboard. We are using these for selecting and exe-

FREE 30 DAY PREVIEW

IN YOUR OWN HOME

MOVING PICTURES TO HELP YOU TAKE BETTER STILLS.

Share the "total experience" of picture taking with today's top professionals


MODERN PHOTOGRAPHY
VIDEO MAGAZINE
MODERN TESTS AUTOFOCUS SLRs
TRAVEL PICTURES By GALEN ROWELL
VIDEO MOVIES & CAMCORDERS By TONY GALLUZZO
SPORTS PHOTOGRAPHY USING LONG LENSES
UNDERWATER PHOTOGRAPHY By BOB HOLLAND
MODERN PHOTOGRAPHY VIDEO MAGAZINE
ABC VIDEO
SUPER HG. Insert this side into recorder
Do not touch the tape inside

Nothing can equal the impact of actually being there. And nothing comes anywhere near video for putting you in the action. Accompany pros who cover the World Series, photograph the oceans' wonders and travel to exotic places. You'll see how they make critical equipment, filter and lens decisions to create some of the world's finest photos.

In the studio, or on location there's no experience like getting close-up views of the pros at work. Seeing them scout locations, plan out shots or work with studio flash units, metering systems, zooms and auto focus SLRs. The excitement of new equipment and methods too difficult to capture in only words and still pictures.

But now, thanks to the home VCR, MODERN PHOTOGRAPHY VIDEO MAGAZINE captures this excitement with full motion and sound. No other medium brings you as close—makes you literally part of the action... right in the picture.

MODERN PHOTOGRAPHY comes alive with video feature stories and regular columns all designed to make you a better photographer. The perfect complement to your regular monthly magazine. You'll get professional demonstrations, see special lab reports plus take a look at the latest technology. Each quarterly video issue holds 60 minutes of useful information featuring MODERN PHOTOGRAPHY's staff of experienced camera professionals—as well as some of the greatest figures in the photographic world! Plus, you'll get to see the FREE Bonus Video features from leading photographic equipment and service companies.

ACT NOW AND SAVE 20%

See for yourself at no risk! Each quarterly video issue costs less than the shooting and processing of two rolls of film. So join the pros in the field, in the studio and in the lab.

FREE 30 DAY PREVIEW OFFER

YES! I'd like my FREE PREVIEW of MODERN PHOTOGRAPHY VIDEO MAGAZINE, each video issue designed to give me information on how to take better pictures and to keep me up-to-date on the latest equipment and accessories.

Send my FREE 30 DAY PREVIEW, and sign me up for one full year for only $79.95, a 20% savings off the single copy price. I'll receive a total of 4 quarterly cassettes—a $99.75 value! If I'm not completely satisfied with the premiere video, I can return the tape within 30 days and owe nothing. Plus, I may cancel my subscription at any time and receive a full refund for any video issues not shipped.

❑ VHS ❑ BETA Allow 6 to 8 weeks for delivery
❑ Bill me just $79.95.
Bill my ❑ VISA or ❑ MASTERCARD

Account Number _____ Expire Date _____
Signature _____
Name _____
Address _____
City _____ State _____ Zip _____
Phone No. _____

Modern Photography Video Magazine
Box 11368, Des Moines IA 50340-1368
Rush orders call 1-800-999-8783

GCGD2

cuting the menu choices. They can, however, be modified by simultaneously pressing the CONTROL key and the key to be changed.

The default CAPS LOCK key has no apparent effect on the CP/M keyboard. It is possible to go into the CAPS LOCK mode by pressing the Commodore key. This will cause any letter key to be returned as a capital while punctuation and numbers remain unchanged. This mode remains in effect until the Commodore key is pressed again. This means that the Commodore key values are not practical to redefine.

In our example, we want to modify the F1 key, so press F1. The menu shows that this key is undefined—it returns "F1" when pressed. The highlight is on the first choice, the normal, unshifted F1. Press RETURN to continue.

The next menu will allow you to modify the selected key in five ways:

Assign a string
Assign a new character
Assign a color
Assign a hex value
Assign a special function

For our example, we need the first choice.

Now, KEYFIG gives us two screens of key definitions to choose from. Some of these are, as yet, undefined. You may choose any selection from this library. KEYFIG will allow you to store up to 31 definitions in any CP/M+ file. You may define, for instance, line 10 as the string "dog" and assign that definition to the ESCape key. Keep in mind that if you later select line 10 from the library, redefine it as "cat," and assign it to F7, the ESCape key will also be assigned "cat." The original definition of the ESCape key will be lost.

Notice that the first screen includes the function keys to modify. F1 is in line 00, and we could select this choice to modify. But there is an easier way to assign DIR to F1.

As you may have discovered, pressing F3 will give you the DIR command followed by a return. It's often convenient to include a return as the last character in a command string so the string will execute automatically. (If you've used the 128's KEY command you may be familiar with the idea.) But, as you'll learn shortly, pressing RETURN while editing a string in KEYFIG tells the program you've finished with that string. So how can you place a return in a command string? KEYFIG has a solution to this problem. When you want a return in a definition, simply press CONTROL-M. This appears as ^M in the KEYFIG library. (Any control codes will use the ^ character to indicate the CONTROL key.) Now notice that DIR^M is in line 02 of the library. All we need to do is assign DIR^M to F1. Use the down arrow to highlight line 02, and press RETURN.

Now the real work is ready to be done. The next menu will allow you to either accept or modify the definition you have just chosen. Remember that if you modify a definition here, it will automatically change in the library list in the previous menu.

Since we want to accept the current DIR^M definition, press RETURN—we're back at the key selection menu. Our new key assignment is shown in the first line.

A Full Directory

Now, let's move on to the second part of our example. Remember, we want to be able to see the whole directory including time and date stamping for all user areas on the current disk drive at the touch of the F2 key.

The F1 key should still be on the key selection menu. Notice that both the SHIFTed value and the CONTROL value currently contain "F2". Move the highlight down to the SHIFTED value line (line 3) and press RETURN.

As in our first example, we will select the *Assign a string* option from the next menu. This brings us to the 31-option library. There is no ready-made definition to plug in this time, so highlight line 01, "F2", and press RETURN.

Now, type in the command to be assigned to the F2 key:

```
DIR[FULL,USER=ALL]^M
```

To accept the new definition, press RETURN and, again, we're back at the key selection menu. This time, our new key assignment is shown in the SHIFTed line *and* in the CONTROL line. The new definition has been assigned to both locations because both keys originally used string 01 from the library. This was not the case in the first part of our example, which used the F1 key since the first two values functioned independently. Changing the normal value did not affect the Commodore key value.

Even though only 11 characters will be printed on the menu, the entire string is held in memory and will be executed properly. To check this, move through the menus to the library section, and you will see the entire definition in line 01.

When you have finished modifying keys, select the *Exit and Save your Work File* option from the beginning menu. You must save your work if you wish to use your new definitions.

If you will need your modifications only for the current work session, or if you want to test your redefinitions before you save them, you can save your work as the current definitions.

KEYFIG will also allow you to save your work on the disk as part of the CP/M+ file. In this way, your new definitions will be loaded each time you boot the computer in CP/M mode. (If you exit KEYFIG and save your workfile as the current definitions, you can still save these to the boot disk by reentering KEYFIG later, selecting the current definitions as your workfile, and saving this workfile on the boot disk.) If you keep a customized copy of CP/M+ on each applications disk (perhaps with a special PROFILE.SUB file for automatically executing a series of commands), each word processor, spreadsheet, database, or other program can have its own keyboard assignments and specialized function keys.

By following the menus, it is possible to reconfigure your CP/M keyboard to better serve your particular needs. KEYFIG gives you a flexibility unknown in the 128 or 64 modes. Experiment and discover what works best for you.

Some Ideas

Here are a few other customizing ideas you might want to try.

- The ALT key could be programmed to alternate disk drives. The normal, CP/M default drive is A:. If you need to switch to drive B:,

JUST ARRIVED from Holland exclusively for H&P of America

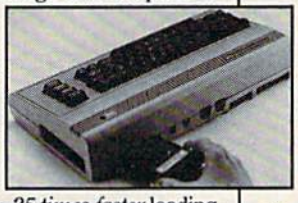
The Ultimate Development for your Commodore Computer

THE FINAL CARTRIDGE® III

All New, Now with Windows!

Totally redesigned, The FINAL CARTRIDGE III is a 64K, completely external operating system created specifically for the Commodore 64, 64C and 128 (in C64 mode).
Simply plug it in and you have more than 60 new COMMANDS and FUNCTIONS added to your computer with no loss of memory. Easy to use Windows and Pull-Down Menus work with either mouse, joystick or keyboard. Transforms your Commodore into an Amiga look-a-like. An unlimited number of windows can actually be open and on the screen at the same time. Use pre-programmed windows or add your own.

The original Final Cartridge took the place of 6 separate devices, but the FINAL CARTRIDGE III does all that plus much more.



A partial listing of some of The Final Cartridge III's features: **1)** Disk Turbo–*25 times faster* loading with special formatting, 15 times faster by direct loading and saving; Tape Turbo–*10-15 times faster* tape access; **2)** Pre-programmed Function Keys–simple keystroke for most often used command sequences for RUN, LOAD, SAVE, CATALOG, Disk Commands, LIST (removes all protections); **3)** Extended Machine Language Monitor–with relocated load-scrolling up or down, bankswitching, and more; **4)** Built-in Printer Interface(cable optional)–prints all Commodore graphics and control codes with screendump utility; **5)** Basic Tool Kit with many pre-programmed functions to help the serious programmer–Automatic Line Renumbering (includes Gotos and Gosubs), Delete, Old (recovers accidentally-deleted programs), Find (locate specific lines), Help (debugging utility), Disk Append (easily add new programs to existing files), and more; **6)** Backup Capability–backup any memory resident software at any point after load; **7)** Built-in 70 Column (80 Column printing) window driven word processor with proportional characters; **8)** Built-in Clock/Calendar and Calculator; **9)** Joystick Port Changer; **10)** Keyboard Extras (scrolling up and down and re-start listings; **11)** 24K extra RAM available for basic programs; **12)** Operates printer as a typewriter; **plus much more.**

The Final Cartridge III has an improved Window driven Freezer with 16 sub menus, color changes, 4 resets, centronics/serial screendumps, print vector setting, reverse printing, stop and continue almost every program, make a total backup to disk or tape (backup will run without cartridge), does 50K in 10 seconds, built-in sprite killer.

The Screendump capability allows printing of low-res, high-res and multicolor in 12 shades of grey or full color, prints full page, Character mode, banner, small, large, color, sprites, searches automatically from memory address of picture.

So many features that space does not allow full description. Call or write for complete information.

"...I can't begin to think of a cartridge which does so many useful things...a tremendous value, a must item for the BASIC and machine-language programmer."
–Art Hunkins, Compute's Gazette 7/87

"No need for all those extras when you have this C-64 assistant...a conventional review doesn't do the Final Cartridge justice...fun at this price is a rarity."
–Tim Walsh, Run Magazine 9/87

One year warranty plus 100% refund if not completely satisfied within 10 days.

Final Cartridge III $69.95
Final Cartridge II* $39.95
Final Cartridge I* $24.95
Standard Centronics Printer Cable $19.95
*limited quantities available

Attention Schools and Educators

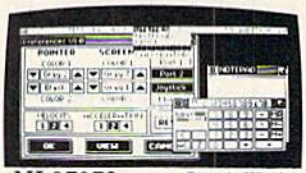
C-Scan + is the ultimate network for Commodore computers, eight computers share one or two disk drives, and only one printer and software program is needed. Simple installation, auto scanning and auto power on. Works with The Final Cartridge. 1 year warranty.

C-Scan + ... $199.95
Cables available in the following lengths:
9 ft....$13.95
12 ft....$15.95
18 ft....$17.95
36 ft....$19.95

Special prices for certified user groups. Dealer and Distributor inquiries welcome.

Sample Window

H&P Home Personal COMPUTERS OF AMERICA THE FINAL CARTRIDGE®


Sample Window

Home & Personal Computers of America, 154 Valley Street, South Orange, NJ 07079
201-763-3946 or, dealers only, 201-763-1693

Improvements to let you get the most out of your computer...

press ALT, which can be defined as B:^M in the normal position and A:^M in the shifted position (for changing back to the default drive).

• If you use a program such as *WordStar* for word processing or NSWP (New SWeeP) for file management, you may want to define your ALT key as LB:^M and LA:^M. Both of these programs use *L* to initiate a change in the logged disk drive. You may wish to keep the LB:^M and LA:^M sequence only on your word processing disk and the more generic B:^M and A:^M on your CP/M system disk.

• The HELP key could be defined as HELP^M. This would automatically execute the file HELP.COM from the A> prompt (if you have HELP.COM and HELP.HLP on the disk in drive A:).

• If you regularly use a program which requires TABbing to a position other than the five spaces preset by the TAB key, you could define TAB as ^I^I for a ten-space TAB or ^I^I^I for a 15-space TAB, or you could simply insert the number of blank spaces you need for your application.

• The cursor keys in the lower right of the keyboard may need to be redefined for some programs. The default values are ^X (CRSR DOWN), ^W (CRSR UP), ^F (CRSR RIGHT), and ^A (CRSR LEFT). Many CP/M programs use ^X, ^E, ^D, and ^S for these cursor movements.

• The RUN/STOP key is unused in the CP/M mode except to toggle the READ/WRITE display in the lower right corner of the screen. This is a good place to add your own key definitions.

• You can redefine your numeric keypad as a cursor control area to use in word processing and spreadsheet programs. The values 8, 2, 6, and 4 can be redefined as cursor up, down, right, and left. The remaining numbers—9, 3, 7, and 1—could be used for other functions like page up, page down, go to top of file, and go to end of file.

• If you use a different computer that has an IBM Selectric keyboard layout, you can reconfigure your 128 to emulate that computer's keyboard.

User Group Update

Caroline D. Hanlon

This list includes updated entries to our annual "Guide to Commodore User Groups," which last appeared in the May and June 1987 issues.

When writing to a user group for information, please remember to enclose a self-addressed envelope with postage that is appropriate for the country to which you are writing.

Send typed additions, corrections, and deletions for this list to:

COMPUTE! Publications
P.O. Box 5406
Greensboro, NC 27403
Attn: Commodore User Groups

User Group Notes

The National Association of Blind and Visually Impaired Computer Users (NABVICU) has organized a user group. For more information, write the **International Blind Users Group (I-BUG),** P.O. Box 1352, Roseville, CA 95661-1352.

AJ's User Group in Brampton, Ontario, Canada has disbanded.

The **Commodore 64/128 User Group** in Hot Springs, AR, has changed its name and address to **Commodore User Group**, Rt. 9, Box 354-A, Hot Springs, AR 71913.

New Listings

CALIFORNIA

Southern California Commodore Users Group, 11018 E. Rosencrans Ave., Suite 203, Norwalk, CA 90805

COLORADO

Commodore User Group, P.O. Box 272, Niwot, CO 80544

DELAWARE

Special Interest Groups NULL (S*I*G*NULL), 2438 Owen Dr., Wilmington, DE 19808

FLORIDA

Lake/Sumter Commodore Users Group, P.O. Box 416, Leesburg, FL 32749

MAINE

Northern Maine Commodore User's Group, P.O. Box 493, Loring AFB, ME 04751

MARYLAND

National Bureau of Standards Commodore Users Group, 8 Cross Ridge Ct., Germantown, MD 20874

MINNESOTA

Saint Paul MCUA, 2418 E. South Ave., No. St. Paul, MN 55109

3M Personal Computing Club, Commodore SIG, 3M Center Bldg., 235-3E-08, St. Paul, MN 55144

MONTANA

Commodore Programs Inc., 740 Eastside Rd., Deer Lodge, MT 59722 (This is a mail-in group only.)

NEW JERSEY

Data Exchange Beneficial Users Group 64/128, 213 Burns Way, Fanwood, NJ 07023

OKLAHOMA

Tulsa Area Commodore Users Group, 2851 E. 21st Pl., Tulsa, OK 74114

VIRGINIA

Portsmouth Commodore Users Group (PCUG), P.O. Box 6561, Portsmouth, VA 23703

WISCONSIN

715 Commodore Users Group, 1052 S. Fork Dr., River Falls, WI 54022

Outside the U.S.

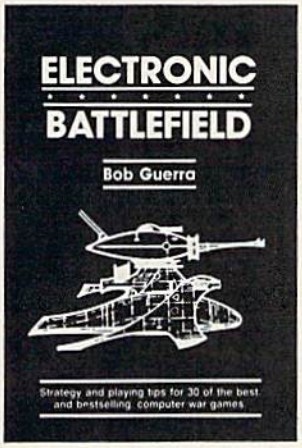
BRAZIL

Commodore Grupos de Usuarios, Carlos A. Silva, Rua Gen. Roca 176, Apt. 501, Rio de Janeiro, RJ 20521, Brazil

Commodore Users Group Porto Alegre, Ferreira de Abreu, 91/3, Porto Alegre, RS, 90040, Brazil

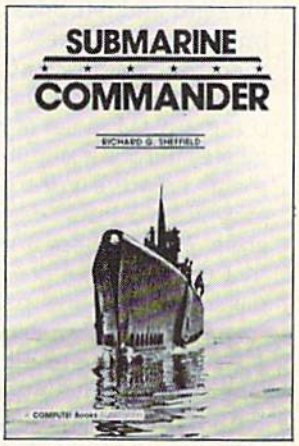
New from COMPUTE!

War game simulations come alive with two new books from COMPUTE!. Whether you're dodging torpedoes, bombing targets, or planning to defend against an enemy invasion, these books contain the hints and strategies you need for a successful defense—and offense. There's historical information on actual battles, technical information about your war machines, plus many tips on using hidden features of the software.



The Electronic Battlefield
Bob Guerra
ISBN 0-87455-117-X
$12.95

This comprehensive reference book on computer war games—how to play them and what strategies to use—will find a place on thousands of computer owners' desks. Whether acting as fierce opponent or impartial referee, the computer is perfect for war game play. *The Electronic Battlefield* offers general and specific hints, tips, and play techniques for all the most popular computer games. Filled with detailed information on such games as *Silent Service, Roadwar 2000, Field of Fire, Arctic Fox,* and *Balance of Power,* this book will appeal to players of all ages and levels of experience. Also included in this book are undocumented features of games like *F-15 Strike Eagle,* command reference charts for many of the games, and even tips from the game designers. The perfect resource for any electronic war gamer.



Sub Commander: Tactics and Strategy for WWII Submarine Simulations
Richard G. Sheffield
ISBN 0-87455-127-7
$12.95

Run silent, run deep. This hands-on approach to popular submarine simulators like *Silent Service, Gato, Sub Battle,* and *Up Periscope* puts you at the periscope of an American boat in World War II. This collection of undersea warfare tactics and strategies will appeal to every simulator captain. Information about actual World War II submarines, crews, and captains provides an excellent introduction. Detailed accounts of real submarine battles illustrate ways you can pilot your own electronic sub. The heart of the book outlines offensive and defensive tactics and maneuvers that bring you into torpedo range and get you out again safely. Learn how to decimate heavily escorted convoys, how to shoot "down the throat" at a charging destroyer, and how to weather determined-depth charge attacks. You'll be able to immediately apply these techniques and tricks to your own submarine software.

Note: The books do not include any of the software products mentioned.

To order COMPUTE! books, call toll free 1-800-346-6767 (in NY 212-887-8525) or write COMPUTE! Books, Customer Service, P.O. Box 5038, F.D.R. Station, New York, NY 10150. Customer Service hours are 10:00 a.m. to 12:30 p.m. and 1:30 p.m. to 3:30 p.m. EST Monday through Friday.

Please add $2.00 per book shipping and handling. NC residents add 5 percent sales tax and NY residents add 8.25 percent sales tax. Please allow 4–6 weeks for delivery.

COMPUTE! books are available outside the United States from subsidiaries of McGraw-Hill International Book Company.

COMPUTE! Publications, Inc. abc Part of ABC Consumer Magazines, Inc. One of the ABC Publishing Companies

Grafnastics

Robert Bixby

If you want to fine-tune your graphics for world-class performance, then "Grafnastics" may be just what you need. With these programs you can make your graphics images do somersaults. For the 64 with disk drive.

Have you ever wished you could take one of your hi-res graphics images and mirror one side to the other, create a deep perspective, reverse the right and left sides, or rotate the image 180 degrees? If you have, then the programs accompanying this article are for you. "Grafnastics" (Program 1) is a set of machine language subroutines that give you unusual creative control over your graphics. "Sample Sketcher" (Program 2) is a short BASIC program that demonstrates how to use Grafnastics in your own programs.

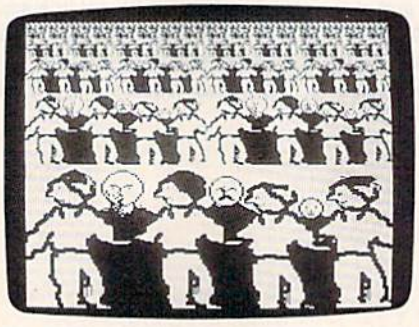
Because Grafnastics (Program 1) is written entirely in machine language, it must be entered using "MLX," the machine language entry program found elsewhere in this issue. Be sure to read the instructions for using MLX before you begin entering data. When you run MLX, you'll be asked for a starting and an ending address for the data you'll be entering. The correct values for Grafnastics are as follows:

Starting address: C000
Ending address: C6D7

After you've entered all the data, be sure to save a copy to disk with the name GRAFNASTICS before leaving MLX.

Using Grafnastics

To get started, load Grafnastics with the statement LOAD "GRAFNASTICS",8,1, and then type NEW. Grafnastics is now resident and ready for you to use. To access the Grafnastics subroutines, type SYS 49152,*n*, where *n* is the number of the routine you want to use. The routines—values for *n*—are as follows:



The Perspective option was used to quickly multiply a single row of figures.

0 provides a help screen which lists the values for *n* and offers a brief description of each routine.

1 creates perspective. Grafnastics takes the image on the bottom half of the screen and creates a seemingly infinite series of copies above it. Each succeeding row contains double the number of images from the previous row, drawn half the size of the previous row's. For example, if the bottom of the screen has a drawing of four soldiers, the next row will have eight soldiers—half the size of the first row's; the third row will have sixteen soldiers—half the size of the second row's, and so on.

2 mirrors the left half of the screen onto the right half.

3 mirrors the right half of the screen onto the left half.

4 mirrors the top of the screen to the bottom.

5 mirrors the bottom half of the screen to the top.

6 rotates the picture 180 degrees.

7 flips the picture so right and left are reversed. Note that flipping horizontally and rotating is the same as flipping vertically. For this reason, there's no need for a separate vertical-flipping routine.

8 switches to the high-resolution screen.

9 switches to the text screen.

10 recalls a screen that has been saved with the archive routine (discussed below). Each time a routine is called, Grafnastics saves the current screen before it is altered. If you don't like your changes, use this routine to go back to your previous drawing.

11 activates the archive routine that saves a copy of the screen.

12 clears the screen.

Drawing A Pixel

The Grafnastics routines operate on the high-resolution screen at memory location 24576. (This is the screen used by *Koala Painter, Doodle,* and many other 64 graphics routines.) All Grafnastics screens are in black-and-white. The hi-res screen is divided into 320 horizontal pixels and 200 vertical pixels.

Programming Books

from COMPUTE!

COMPUTE! Books offers a line of programming books for the intermediate to advanced Commodore 64 and 128 users. These reference books take you beyond BASIC and into machine language programming, helping you learn about memory maps, addresses, the new *GEOS*, and time-saving routines you can add to your own programs.

COMPUTE!'s 128 Programmer's Guide

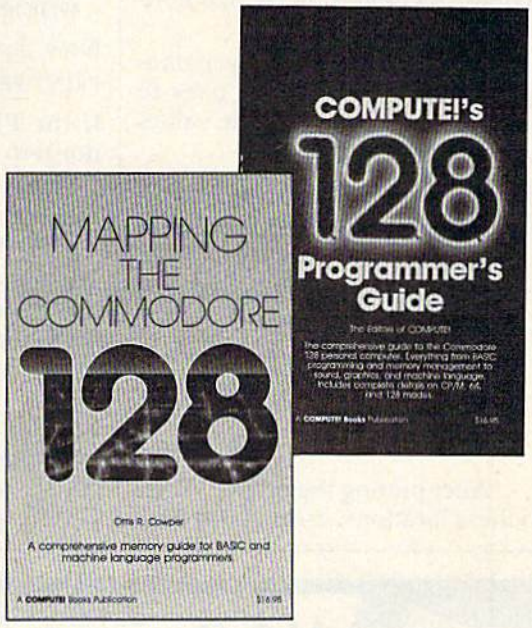
Editors of COMPUTE!
ISBN 0-87455-031-9 444 pages
A complete guide to the Commodore 128, this book explores BASIC 7.0, shows you how to create graphics and sounds, explains how to program peripherals, and introduces you to machine language programming.
$17.95

Mapping the Commodore 128

Ottis R. Cowper
ISBN 0-87455-060-2 704 pages
The comprehensive memory map and programmer's guide that provides a detailed explanation of the inner workings of the Commodore 128 including memory management, BASIC 7.0, I/O chip register, the operating system, system RAM, and more.
$19.95

Machine Language Routines for the Commodore 128 and 64

Todd Heimarck and Patrick Parrish
ISBN 0-87455-085-8 592 pages
This collection of machine language routines is a must for every Commodore 128 and 64 machine language programmer. Scores of these routines can simply be inserted into your own programs. Included is the assembly language code with easy-to-understand documentation and instructions. *There is a companion disk available for $12.95 that includes all the programs in the book* (858BDSK).
$18.95



Programming the Commodore 64 Revised: The Definitive Guide

Raeto Collin West
ISBN 0-87455-081-5 642 pages
This bestselling, encyclopedic reference guide which covers the Commodore 64 in its entirety has been updated to include information on the new Commodore 64C and *GEOS*, from Berkeley Softworks. *There is also a disk available for $12.95 which includes the programs in the book* (507BDSK).
$24.95

Mapping the Commodore 64 and 64C

Sheldon Leemon
ISBN 0-87455-082-3 324 pages
An update of the bestselling memory map and programming guide that's a necessity for intermediate and advanced programmers. This definitive sourcebook has been expanded and now covers the new icon-based *GEOS* (Graphics Environment Operating System) with clear descriptions of how to make it work for you. For BASIC and machine language programmers of both the Commodore 64 and 64C.
$16.95

These books are now available at your local book or computer store.
You can also order directly from COMPUTE! by calling toll free 800-346-6767 (in NY call 212-887-8525) or by mailing your order to COMPUTE! Books, P.O. Box 5038, F.D.R. Station, New York, NY 10150.

Customer Service hours are 10:00 am–12:30 pm and 1:30 pm–3:00 pm EST, Monday–Friday
Please include $2.00 postage and handling per book or disk. NC residents add 5 percent sales tax, and NY residents add 8.25 percent sales tax. Please allow 4–6 weeks for delivery.

COMPUTE! Publications, Inc.
Part of ABC Consumer Magazines, Inc.
One of the ABC Publishing Companies

COMPUTE! books are available outside the United States from subsidiaries of McGraw-Hill International Book Company.

You must POKE values into memory locations corresponding to these pixels (0–319 and 0–199), but you can't POKE a number larger than 255. To get around this limitation, Grafnastics divides the horizontal screen into two regions. The first (region 0, the left four-fifths of the hi-res screen) comprises the initial 256 horizontal locations, while the second (region 1, the right one-fifth of the screen) comprises the remaining 64 (256 + 64 = 320 horizontal pixels).

Following is a list of the memory locations Grafnastics uses to draw on the screen, and the values for each.

- 49716: The region number (0 or 1).
- 49715: The horizontal location of the pixel (0–255 or 0–63).
- 49718: The vertical location of the pixel (0–199).
- 49711: One of three values—1 turns the pixel on, 2 turns it off, and 0 peeks to see whether a pixel is on or off.

After putting the proper values in these locations, use SYS 49483 to draw, erase, or check the pixel's status. Let's plot, PEEK, erase, and PEEK again, the pixel in the center of the screen.

First, let's plot the point. Enter and execute the following statement in direct mode:

```
POKE 49716,0:POKE 49715,160:POKE
49718,100:POKE 49711,1:SYS 49483
```

That plots the center pixel. But is it really plotted? Let's check.

```
POKE 49716,0:POKE 49715,160:POKE
49718,100:POKE 49711,0:SYS 49483
```

Now type

```
PRINT PEEK(2)
```

If the PEEK statement returns a nonzero value, the pixel is plotted. To erase a pixel, type

```
POKE 49716,0:POKE 49715,160:POKE
49718,100:POKE 49711,2:SYS 49483
```

You have erased your pixel. To make sure, check it just the way you did before. Now the value should be 0, indicating your pixel is gone.

Sample Sketcher

To make drawing with Grafnastics (Program 1) easy, you can use the BASIC program Sample Sketcher (Program 2). First, type it in and save a copy. Next, load it and type RUN. Sample Sketcher loads GRAFNASTICS and then displays the main menu. Following is a summary of Sample Sketcher's commands:

M	Display the menu.
0	Peek screen locations.
1	Draw on the hi-res screen with the joystick.
2	Erase using the joystick.
H	Go to the hi-res screen.
P	Perspective (see description in article, above).
R	Rotate the screen.
T	Go to the text screen.
U	Undo (recall a screen from archive).
I	Invert the screen.
S	Save a screen.
L	Load a screen.
C	Clear the screen.
Cursor Left	Mirror the screen right to left.
Cursor Right	Mirror the screen left to right.
Cursor Down	Mirror the screen top to bottom.
Cursor Up	Mirror the screen bottom to top.

See program listings on page 97.

V4.0 ULTRABYTE DISK NIBBLER

POWERFUL NEW GCR NIBBLER
FOR COMMODORE 64 and 128 (in 64 mode)

- Automatically copies most disks in 2 minutes or less including variable density and rapid locked protection
- 105 new parameters to make unprotected copies of recent disks. Send stamped envelope for list
- Copies up to 40 tracks using 1 or 2 1541 or 1571 drives. Copies both sides on 1571
- Copies itself (for this reason, no refunds given)

SPECIAL — BUY A NIBBLER V4.0 AND GET YOUR CHOICE OF A FREE $14.95 PROGRAM
$39.95 plus $4.00 shipping

1. Disk Surgeon V2.0 -- new disk utility $14.95
2. Ultramail -- mail list and labels ..... } both for
   Handy-Capper -- race handicapper ..... } $14.95
3. McMurphy's Mansion -- text adventure ... } both for
   Soluware -- solutions to 10 adventures ... } $14.95

(Above may be ordered separately for $14.95 plus $4.00 shipping. Foreign orders add $2.00)

Mastercard, Visa, Check or M.O., Calif. add 6.5% ($2.60) sales tax. Foreign orders / COD add $2.00. Payment must be in U.S. funds

UPDATES - Return original Ultrabyte disk with $15.00 plus $4.00 shipping. Foreign add $2.00. No free disk with update

To order, write or call 24 hr. order line. For info. write.
ULTRABYTE (818) 796 - 0576
P.O. Box 789 LaCanada, CA 91011 USA

DEALERS & DISTRIBUTORS WANTED

COMPUTE!'s Gazette Subscriber Services

Please help us serve you better. If you need to contact us for any of the reasons listed below, write to us at:

COMPUTE!'s Gazette
P.O. Box 10957
Des Moines, IA 50340

or call the Toll Free number listed below.

Change of Address. Please allow us 6–8 weeks to effect the change; send your current mailing label along with your new address.

Renewal. Should you wish to renew your Gazette subscription before we remind you to, send your current mailing label with payment or charge number, or call the Toll Free number listed below.

New Subscription. A one-year (12-month) U.S. subscription to *COMPUTE!'s Gazette* is $24 (2 years, $45; 3 years, $65). For subscription rates outside the U.S., see staff page. Send us your name and address or call the Toll Free number listed below.

Delivery Problems. If you receive duplicate issues of *COMPUTE!'s Gazette*, if you experience late delivery, or if you have problems with your subscription, please call the Toll Free number listed below.

COMPUTE!'s Gazette
1-800-727-6937

Disk Rapid Transit

Ken Turcotte

Easily the fastest file copier we've ever published, "Disk Rapid Transit" copies any file or group of files—BASIC or machine language. For the 64 with either one or two disk drives.

What's the easiest and fastest way to copy files from one disk to another? The jury's still out, but "Disk Rapid Transit" is right up there among the leaders, surpassing even many commercial file copiers.

Disk Rapid Transit works with one or two 1541 or 1571 disk drives. It can copy a 130-block file in 35 seconds—that's about five times the speed of the 1541 using the built in DOS routines. And it's easy to use—just select the files you want to copy and follow the prompts. Disk Rapid Transit can also make multiple copies—read the file once and then save it to as many disks as you like.

[Ed. note: Disk Rapid Transit is intended for copying only nonprotected disks. Certain protection schemes contain information that could send the program into an infinite loop.]

Typing It In

Disk Rapid Transit is written in machine language, so you'll need to type it in using "MLX," the machine language entry program found elsewhere in this issue. When MLX asks for starting and ending addresses, respond with the following values:

Starting address: 0801
Ending address: 1988

Be sure to save a copy to disk before leaving MLX.

Although the program is written in machine language, it loads and runs like a BASIC program. When you're ready to use Disk Rapid Transit, load the program and type RUN. The first thing you'll see is the main menu. From this menu, you can toggle the number of the current drive, view the directory of the current drive, perform a software drive number change, exit to BASIC, or begin the copying procedure.

Using Two Drives

If you are using two drives to make copies, one should be designated drive 8; the other, drive 9. When you buy a disk drive, it is normally numbered as drive 8. A 1571 drive can be set to drive 9 by flipping a switch on the rear of the drive (see your drive manual for details). A 1541 drive, on the other hand, requires a hardware modification in order to permanently renumber the drive. As an alternative, Disk Rapid Transit allows you to change the drive number via software. Select R to renumber the drive. You will be instructed to turn off all drives except the one you wish to renumber and then press RETURN to continue. When prompted, turn your other drive(s) back on.

Disk Rapid Transit defaults to drive number 8. This is the current drive, the drive from which you will copy files. Press T to change the current drive to device 9. Press T again to toggle it back to 8.

To view the directory of the current drive, type $.

Easy To Use

If you own two disk drives and you're going to be copying several files from the same disk, it's best to use both of them to eliminate the need for disk swapping.

When you're ready to copy files, select 1 for a one-drive copy or 2 for a two-drive copy. The screen clears and then displays a new menu at the bottom. At the top of the screen, above a divider, is a list of the files on the disk. If there are more than 16 files, you can step through the pages with the + and − keys. If you wish to return to the main menu, press A.

Use the cursor keys to move the cursor up and down the screen. Press the space bar to select the files that you want to copy. Each file is highlighted as you select it.

If you wish to copy all the files on a disk, make sure that no files are already highlighted and press f1. This is much simpler than highlighting each file individually. If you want to copy all but a few files from the disk, highlight just the ones you don't want and then press f1. Pressing f1 actually changes the state of all the files (from highlighted to unhighlighted or vice versa).

After you've selected the files you wish to copy, press C (for Copy) or M (for Multiple copies), depending on whether or not you wish to make more than one copy of each file. If you are using two drives and you press C, all the files will be copied. If you select multiple copies, as each file is copied, you will be prompted to copy the file again or go on to the next file. Disk Rapid Transit will take you through the copying procedure. Be sure to follow all the instructions carefully. If you're copying files to a blank disk, be sure that the disk has been formatted.

See program listing on page 103.

Dynamic Screen

André Delisle

Here are two creative utilities that allow you to animate text on your screen—game instructions, menus, and help files are just three examples. With these programs, you can create moving, colorful screens and display them in your own programs. For the 128, 64, Plus/4, and 16. A disk drive is required.

Have you ever wished there was a way to make your information screens more eye-catching and interesting? It's often difficult to be creative with menus and help screens, but the two BASIC programs accompanying this article give you just the tools you need. With "Dynamic Screen" (Program 1) you can create menus, help screens, title screens, and all kinds of instructions that move and change color. "Dynamic Screen Reader" (Program 2) makes it easy to display these animated screens in your own programs.

To get started with Dynamic Screen (Program 1), simply type it in and save a copy. Be sure to use "The Automatic Proofreader" included elsewhere in this issue to prevent typing mistakes. When you run Dynamic Screen, the main menu will present you with four choices: *Edit screen*, *Read screen*, *Directory*, and *Exit*. To make a selection, move through the options using your cursor keys. Press RETURN when the option you want is highlighted. Let's go through the steps to edit and read a screen.

Creating A Screen

To create a screen, choose the *Edit screen* option from the menu. The program will ask you for a name for your screen. If a screen already has the same name, it will be erased, so be sure to use a new name or the name of an old screen you don't mind erasing. After typing in a name, you'll be presented with a blank screen. This is your canvas. Anything you type—including cursor movement keys, color changes, and so on—will be recorded by Dynamic Screen so the screen can be displayed later. Dynamic Screen disables the INST/DEL key, so to erase, move the cursor to the character you want to rub out and press the space bar. It's the ability to erase that gives Dynamic Screen its power to animate. Pressing RETURN while in *Edit screen* tells the program you're through designing the screen, so be sure not to press it until you're finished.

Let's create a simple animated screen. First, just type your name. Now, move the cursor back over your name to the first letter. Press the space bar to erase the first letter. Then type your name again, over the characters remaining on the screen from the first time you typed it. This time your name should be one space to the right of its original position. Move the cursor back to the first letter and repeat the process, erasing the first letter and typing your name one space further to the right each time. Try changing colors and using reverse video. You may notice that you can type in Dynamic Screen's border area and even scroll the border off the screen. This will be recorded just as you type it, so be very attentive as you create.

When you're through, press RETURN. Now select *Read screen* from the menu. When prompted for a filename, type the name you used for your screen in *Edit screen* mode. Now sit back and enjoy the show. You can use *Read screen* to view any screen you've created with Dynamic Screen.

The *Directory* option gives you a list of files on a disk, with a slight twist. Screens are stored as SEQ files, so *Directory* places a red arrow to the right of each SEQ filename. Screen filenames have another unique identifying trait. Dynamic Screen inserts a £ character in front of the name of any file saved from within Dynamic Screen. The red arrows and the £ character at the beginning of each filename make your screen files easy to spot in directory listings. When you finish viewing the directory, press RETURN to go back to the main menu.

When you're ready to leave Dynamic Screen, the last menu option, *Exit*, returns you to BASIC.

Programming With Dynamic Screen Reader

If you want to incorporate dynamic screens into your own programs, you can use Dynamic Screen Reader (Program 2) as a subroutine. To begin, type it in and save a copy to disk. To prepare the subroutine for use, all you need to do is insert the filename of the screen (created by Program 1) you want to display. Replace the name DEMO in line 80 of Dynamic Screen Reader (Program 2) with the name of the screen you want to display. Now you're ready to call the subroutine and read a screen.

See program listings on page 102.

PrintScreen

James Host

This is one of the most full-featured screen dumps we've ever seen—it lets you send your favorite screens to your printer—including those with hi-res graphics, sprites, or redefined character graphics. For the Commodore 64 and most printers.

With all the flexibility of the 64's graphics, sooner or later, you'll find yourself wishing that you could send everything on your screen to your printer. Perhaps the most common way to do this is to use a BASIC subroutine similar to this one:

```
910 PRINT"{HOME}";
920 OPEN 3,3,3
930 OPEN 4,4,0
940 FOR I=0 TO 999
950 GET#3,A$
960 PRINT#4,A$;
970 NEXT
980 PRINT#4
990 CLOSE 4
1000 CLOSE 3
1010 RETURN
```

This method has a few drawbacks. First, it works only with BASIC programs. Also, if your program uses redefined characters, they will show up on the printer as standard characters. And finally, any sprites that you might have on the screen won't appear on the screen dump.

"PrintScreen" solves these problems, printing just about any screen to your printer. It works with custom character graphics, sprites, hi-res screens, and even extended color background mode.

Typing It In

Program 1, PrintScreen, is written entirely in machine language, so you'll need to enter it with "MLX," the machine language entry program found elsewhere in this issue. When MLX requests starting and ending addresses, respond with these values:

Starting address: 0801
Ending address: 0F30

Be sure to save a copy of PrintScreen to disk or tape before exiting MLX.

Program 2, "Printer Changer," is written in BASIC. It must be typed carefully, so be sure to use "The Automatic Proofreader" when you enter the program. Printer Changer is used to customize PrintScreen to work with your printer.

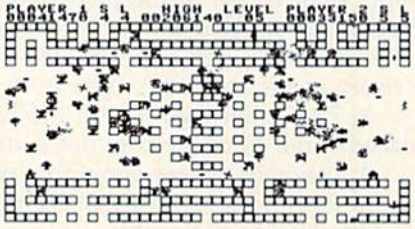
PrintScreen is easy to use: Just load it and type RUN. PrintScreen installs itself in memory. Next, load and run the program that creates the screen you want to print. When the screen is just how you want it, hold down the Commodore logo key and tap RESTORE. The screen freezes. In a few moments, your screen will begin printing. (Note: The sprites will disappear from the screen during the screen dump, but they will be printed.) After the screen dump finishes, your program will continue running where it left off.

Customizing The Program

If PrintScreen does not work correctly with your printer, you'll need to use Program 2, Printer Changer, to customize the program. First, load and run Printer Changer. Be sure you have your printer and interface manuals handy to answer the questions asked by the program.

Answer the prompts carefully. Some of the printer commands that you must supply will consist of more than one number. For these, the Printer Changer will print several question marks, one at a time. Type a single number at each question mark. When you've finished entering all the numbers, press RETURN by itself at the next question-mark prompt.

After all the printer commands have been entered, Printer Changer will instruct you to load and run PrintScreen. Do so, and then save the altered program to disk or tape. If your printer supports several graphics densities, you may want to make several customized screen-dump programs.



This screen dump, from the machine-language game "Crossroads" (elsewhere in this issue), includes sprites and redefined character graphics.

Nearly Foolproof

PrintScreen is nearly foolproof. It works with most BASIC and machine language programs. RUN/STOP–RESTORE does not disable the program. To disable it, you must turn off your computer or type SYS 64738.

The program uses memory locations $CF00–$CFFF and the RAM beneath the I/O block and the Kernal ROM. As long as these areas of memory are not used by the program you load in, PrintScreen should work. One exception: If the program relocates the screen to memory above 49151, the dump won't be accurate.

Printing a screen takes all of the computer's attention—so don't press Commodore-RESTORE while the computer is communicating with a disk drive or modem.

See program listings on page 98.

COMPUTE!'s Gazette Author's Guide

Here are some suggestions which serve to improve the speed and accuracy of publication for prospective authors. COMPUTE!'s GAZETTE is primarily interested in new and timely articles on the Commodore 128, 64, Plus/4, and 16. We are much more concerned with the content of an article than with its style, but articles should as be clear and well-explained as possible.

The guidelines below will permit your good ideas and programs to be more easily edited and published:

1. The upper left corner of the first page should contain your name, address, telephone number, and the date of submission.

2. The following information should appear in the upper right corner of the first page: If your article is specifically directed to one model of computer, please state the model name. In addition, *please indicate the memory requirements of programs.*

3. The underlined title of the article should be placed about ⅔ of the way down the first page.

4. Following pages should be typed normally, except that in the upper right corner there should be an abbreviation of the title, your last name, and the page number—for example: Memory Map/Smith/2.

5. All lines within the text of the article must be double- or triple-spaced. A one-inch margin should be left at the right, left, top, and bottom of each page. No words should be divided at the ends of lines. And please do not right-justify. Leave the lines ragged.

6. Standard typing or computer paper should be used (no erasable, onionskin, or other thin paper), and typing should be on one side of the paper only (upper- and lowercase).

7. If you are submitting more than one article, send each one in a separate mailer with its own tape or disk.

8. Short programs (under 20 lines) can easily be included within the text. Longer programs should be separate listings. *It is essential that we have a copy of the program, recorded twice, on a tape or disk.* If your article was written with a word processor, we request that you include a copy of the text file on the tape or disk. If you include a copy of your article on disk, please save the article as plain text, without any special formatting characters or control codes. Most word processors provide an option for saving a document as plain ASCII text or in unformatted form. Please use high-quality 10- or 30-minute tapes with the program recorded on both sides. The tape or disk should be labeled with your name and the title of the article. Tapes are fairly sturdy, but disks need to be enclosed within plastic or cardboard mailers (available at photography, stationery, or computer supply stores). If possible, programs written in machine language or a compiled language should include source code (or an annotated disassembly if the program was written with a machine language monitor).

9. A good general rule is to spell out the numbers zero through ten in your article and write higher numbers as numerals (1024). The exceptions to this are: Figure 5, Table 3, TAB(4), and so on. Within ordinary text, however, the zero through ten should appear as words, not numbers. Also, symbols and abbreviations should not be used within text: Use *and* (not &), *reference* (not ref.), *through* (not thru).

10. For greater clarity, use all capitals when referring to keys (RETURN, CTRL, SHIFT), BASIC words (LIST, RND, GOTO), and the language BASIC. Headlines and subheads should, however, be initial caps only, and emphasized words are not capitalized. If you wish to emphasize, underline the word; then it will be italicized during typesetting.

11. Articles can be of any length—from a single-line routine to a multiple-issue series. The average article is about four to eight double-spaced, typed pages.

12. We do not consider articles which are submitted simultaneously to other publishers. If you wish to send an article to another magazine for consideration, please do not submit it to us.

13. COMPUTE!'s GAZETTE pays between $70 and $800 for published articles. In general, the rate reflects the length and quality of the article. Payment is made upon acceptance. Following submission (to Editorial Department, COMPUTE!'s GAZETTE, P.O. Box 5406, Greensboro, NC 27403), it will take from four to eight weeks for us to reply. If your work is accepted, you will be notified by a letter which will include a contract for you to sign and return. *Rejected manuscripts are returned to authors who enclose a self-addressed, stamped envelope.*

14. If your article is accepted and you subsequently make improvements to the program, please submit an entirely new tape or disk and a new copy of the article reflecting the update. We cannot easily make revisions to programs and articles. It is necessary that you send the revised version as if it were a new submission entirely, but be sure to indicate that your submission is a revised version by writing *Revision* on the envelope and the article.

15. COMPUTE!'s GAZETTE does not accept unsolicited product reviews.

BEFORE TYPING . . .

Before typing in programs, please refer to "How To Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

GeoTrash Restorer

Article on page 52.

```
KC 10 REM COPYRIGHT 1987 COMPU
      TE! PUBLICATIONS, INC. -
       ALL RIGHTS RESERVED
PX 20 PRINT"{CLR}{43}"CHR$(14):
      POKE53280,0:POKE53281,15
AJ 30 PRINT"{3 SPACES}COPYRIGH
      T 1987 COMPUTE! PUB., IN
      C."
FX 40 PRINTTAB(11)"ALL RIGHTS
      {SPACE}RESERVED"
MC 50 PRINTTAB(13)"{3 DOWN}
      {BLK}TRASH RESTORER{43}"
CH 60 PRINTTAB(7)"{DOWN}BRINGS
       FILES BACK FROM THE"
HE 70 PRINTTAB(7)"GEOS DESKTOP
       WASTE BASKET"
GE 80 PRINTTAB(5)"{4 DOWN}INSE
      RT DISK AND PRESS <RETUR
      N>"
ME 90 GETA$:IFA$<>CHR$(13)THEN
      90
KA 100 PRINT"{CLR}{2 RIGHT}
       {3 DOWN}SEARCHING FOR D
       ISCARDED FILES..."
QR 110 OPEN15,8,15:OPEN8,8,8,"
       #"
EK 120 T=18:S=1:F1=0
SB 130 PRINT#15,"U1:";8;0;T;S:
       PRINT#15,"B-P:";8;0:DR=
       1
CX 140 GET#8,NT$,NS$:NT=ASC(NT
       $+CHR$(0)):NS=ASC(NS$+C
       HR$(0)):F2=0
PC 150 BP=3
RK 160 PRINT#15,"B-P:";8;BP:GE
       T#8,VE$:VE=ASC(VE$+CHR$
       (0))
MC 170 IFVE<1ORVE>35THEN420
FP 180 BP=BP-1
AX 190 PRINT#15,"B-P:";8;BP:GE
       T#8,FT$:FT=ASC(FT$+CHR$
       (0))
BE 200 IFFT<>0THEN420
AA 210 BN=BP+3:NA$=""
RA 220 PRINT#15,"B-P:";8;BN
PF 230 GET#8,N$
PP 240 IFN$=CHR$(160)THEN260
CK 250 NA$=NA$+N$:GOTO230
DM 260 PRINT"{CLR}{5 DOWN}
       {4 RIGHT}"NA$
QB 270 PRINT"{2 RIGHT}{DOWN}HA
       S BEEN DISCARDED"
SG 280 PRINT"{2 DOWN}{2 RIGHT}
       IF YOU WANT TO RESTORE
       {SPACE}IT"
PX 290 PRINT"{2 RIGHT}INDICATE
        FILE TYPE"
AD 300 PRINT"{2 RIGHT}OR 0 TO
       {SPACE}CONTINUE."
SK 310 PRINTTAB(5)"{DOWN}FILE
       {SPACE}TYPE MENU"
PC 320 PRINT"{3 RIGHT}1.
       {2 SPACES}SEQUENTIAL
CD 330 PRINT"{3 RIGHT}2.
       {2 SPACES}PROGRAM
JS 340 PRINT"{3 RIGHT}3.
       {2 SPACES}USER
BF 350 PRINT"{3 RIGHT}4.
       {2 SPACES}RELATIVE
JB 360 INPUT"{DOWN}{4 RIGHT}YO
       UR CHOICE...";CH$
XP 370 IFCH$<"0"ORCH$>"4"THENP
       RINT"{UP}{24 SPACES}
       {2 UP}":GOTO360
XJ 380 IFCH$="0"THEN420
FH 390 PRINT#15,"B-P:";8;BP
JH 400 CH=VAL(CH$)+128
GB 410 PRINT#8,CHR$(CH);:F2=1:
       F1=1
XX 420 DR=DR+1:BP=BP+33
JF 430 IFDR<9THEN160
GP 440 IFF2=0THEN460
HE 450 PRINT#15,"U2:";8;0;T;S
JQ 460 IFNT<>0THENT=NT:S=NS:GO
       TO130
KF 470 IFF1<>0THEN500
HQ 480 PRINTTAB(5)"{2 DOWN}NO
       {SPACE}DISCARDED FILES
       {SPACE}RESTORED."
AF 490 GOTO570
JQ 500 PRINT"{CLR}{2 DOWN}
       {2 RIGHT}TO COMPLETE TH
       E"
JR 510 PRINT"{2 RIGHT}TRASH RE
       STORER PROCESS"
XQ 520 PRINT"{2 RIGHT}BOOT UP
       {SPACE}GEOS"
SG 530 PRINT"{2 RIGHT}AND VALI
       DATE THIS DISK"
KG 540 PRINT"{2 RIGHT}USING TH
       E GEOS VALIDATE COMMAND
       ."
FS 550 PRINTTAB(9)"{2 DOWN}DO
       {SPACE}NOT USE THE NORM
       AL"
FF 560 PRINTTAB(9)"DOS VALIDAT
       E COMMAND!"
QD 570 CLOSE8:CLOSE15
FQ 580 PRINTTAB(4)"{DOWN}PRESS
        <RETURN> TO EXIT TO BA
       SIC"
DE 590 GETA$:IFA$<>CHR$(13)THE
       N590
DF 600 PRINT"{CLR}{37}"CHR$(142
       ):POKE53280,14:POKE5328
       1,6:END
```

Word Find

Article on page 46.

```
KC 10 REM COPYRIGHT 1987 COMPU
      TE! PUBLICATIONS, INC. -
       ALL RIGHTS RESERVED
BP 20 XR=781:YR=782:BO=53280:B
      A=BO+1:Q=12
XD 30 NDX=198:IFPEEK(65530)=5T
      HENBANK15:XR=7:YR=8:NDX=
      208
CX 40 IFPEEK(65530)=164THENXR=
      2035:YR=2036:BO=65305:BA
      =65301:Q=14:NDX=239
KS 50 PL=65520:POKEBO,0:POKEBA
      ,0
KM 60 IFPEEK(65530)<>164THENS=
      54272:FORN=STOS+24:POKEN
      ,0:NEXT
RS 70 AL$="QAZXSWEDCVFRTGBNHYU
      JMKIOLP"
HR 80 PRINT"{CLR}{PUR}
      {3 SPACES}COPYRIGHT 1987
       COMPUTE! PUB., INC."
MM 90 PRINTTAB(10)"ALL RIGHTS
      {SPACE}RESERVED":GOSUB84
      0
QP 100 PRINT"{7 DOWN}"TAB(15)"
       {RVS}WORD FIND{6 DOWN}"
DQ 110 INPUT"WOULD YOU LIKE A
       {SPACE}TIME LIMIT (Y/N)
       ";TL$
BS 120 IFTL$<>"Y"ANDTL$<>"N"TH
       EN120
AQ 130 IFTL$="N"THENTL$="20000
       0":TL=0:GOTO170
RE 140 INPUT"{DOWN}HOW MANY MI
       NUTES (1-59)";TL:IFTL<1
       ORTL>59THEN140
DK 145 IF TL<>INT(TL) THEN 140
KQ 150 TL=INT(TL):TL$=STR$(TL*
       100):TL$=RIGHT$(TL$,LEN
       (TL$)-1):TL=1
DJ 160 FORWW=1TO6-LEN(TL$):TT$
       =TT$+"0":NEXT:TL$=TT$+T
       L$
CM 170 GOSUB770:GOSUB680:GOSUB
       620:GOSUB460:GOSUB420
QX 180 REM - MAIN LOOP -
KR 190 TI$="000000":TU=0:WF=0
SA 200 POKEYR,27:POKEXR,1:SYSP
       L:INPUT"{CYN}ROW ";RO$:
       RO=VAL(RO$)
GC 210 IFRO<1THENBS=0:GOTO240
KK 220 IFRO>20THENBS=1:GOTO240
JG 230 GOSUB1060:GOTO250
FR 240 POKEYR,27:POKEXR,1:SYSP
       L:PRINT"TOO ";BS$(BS):G
       OSUB1070:GOSUB1060:GOTO
       200
PR 250 IFTI$>TL$THENTU=1:GOTO8
       90
QK 260 POKEYR,27:POKEXR,1:SYSP
       L:INPUT"COLUMN ";CO$:CO
       =VAL(CO$)
DE 270 IFCO<1THENBS=0:GOTO300
XD 280 IFCO>20THENBS=1:GOTO300
SF 290 GOSUB1060:GOTO310
RH 300 POKEYR,27:POKEXR,1:SYSP
       L:PRINT"TOO ";BS$(BS):G
       OSUB1070:GOSUB1060:GOTO
       250
XD 310 F=0:FORI=1TONW:IFRO<>PY
       (I)ORCO<>PX(I)THEN330
JH 320 F=2:IFT(I)=0THENX1=I:T(
       I)=1:F=1:I=NW
JE 330 NEXT:IFF=1THEN360
EJ 340 C$="WRONG":IFF=2THENC$=
       "THAT'S FOUND"
RB 350 POKEYR,27:POKEXR,1:SYSP
       L:PRINTC$:GOSUB1070:GOS
       UB1060:GOTO200
RG 360 FORI=0TOLEN(W$(X1))-1:X
       P=3+PX(X1)+I*DX(TW(X1))
MF 370 YP=2+PY(X1)+I*DY(TW(X1)
       ):GOSUB960
BA 380 PRINT"{PUR}"MID$(W$(X1)
       ,I+1,1):GOSUB1030
HJ 390 NEXT:POKEYR,25:POKEXR,2
       +X1:SYSPL:PRINTW$(X1):W
       F=WF+1:IFWF=NWTHEN880
CK 400 GOTO200
MJ 410 REM - FILL GRID -
AX 420 FORY=1TO20:FORX=1TO20
KG 430 IFA$(X,Y)=""THENA$(X,Y)
       =MID$(AL$,26*RND(1)+1,1
       )
BH 440 XP=3+X:YP=2+Y:GOSUB960:
       PRINTA$(X,Y):NEXT:NEXT:
       RETURN
DD 450 REM - POSITION WORDS -
FM 460 PW=0
BP 470 PW=PW+1
FB 480 PX(PW)=INT(20*RND(1)+1)
       :PY(PW)=INT(20*RND(1)+1
       )
BF 490 DR=INT(8*RND(1)+1):TW(P
       W)=DR
SA 500 CX=PX(PW)+LEN(W$(PW))*D
       X(DR):CY=PY(PW)+LEN(W$(
       PW))*DY(DR)
PK 510 IFCX<1ORCX>20ORCY<1ORCY
       >20THEN480
```

```
EJ 520 F=0:FORCK=0TOLEN(W$(PW)
       )-1
ER 530 Z1$=MID$(W$(PW),CK+1,1)
       :Z2$=A$(PX(PW)+CK*DX(DR
       ),PY(PW)+CK*DY(DR))
KS 540 IFZ2$<>""ANDZ1$<>Z2$THE
       NF=1
XM 550 NEXT:IFF=1THEN480
KE 560 FORCK=0TOLEN(W$(PW))-1
EH 570 Z1$=MID$(W$(PW),CK+1,1)
       :A$(PX(PW)+CK*DX(DR),PY
       (PW)+CK*DY(DR))=Z1$
FK 580 XP=25:YP=2+PW:GOSUB960:
       PRINTW$(PW);:NEXT
SM 590 IFPW=NWTHENRETURN
MP 600 GOTO470
DP 610 REM - SORT BY LENGTH -
XQ 620 POKEYR,29:POKEXR,1:SYSP
       L:PRINT"SORTING"
GQ 630 F=0:FORI=1TONW-1
XR 640 IFLEN(W$(I))<LEN(W$(I+1
       ))THENT$=W$(I+1):W$(I+1
       )=W$(I):W$(I)=T$:F=1
FX 650 NEXT:IFF=1THEN630
XS 660 GOSUB1060:RETURN
BP 670 REM - PRINT GRID -
RP 680 PRINT"{CLR}{BLU}
       {2 DOWN}{3 RIGHT}";
DX 690 PRINT"{RVS}{D}";:FORI=1
       TO20:PRINT"{RVS}{I}";:N
       EXT
GF 700 PRINT"{RVS}{F}{DOWN}
       {LEFT}";:FORI=1TO20:PRI
       NT"{RVS}{K}{OFF}{DOWN}
       {LEFT}";:NEXT
SP 710 PRINT"{RVS}{V}{2 LEFT}"
       ;:FORI=1TO20:PRINT"
       {OFF}{I}{2 LEFT}";:NEXT
QM 720 PRINT"{RVS}{C}{LEFT}
       {UP}";:FORI=1TO20:PRINT
       "{OFF}{K}{LEFT}{UP}";:N
       EXT:PRINT"{GRN}"
HF 730 FORI=1TO20:NU$=STR$(I):
       NU$=MID$(NU$,2):IFLEN(N
       U$)=1THENNU$=" "+NU$
AJ 740 XP=1:YP=I+2:GOSUB960:PR
       INTNU$:XP=I+3:YP=0:GOSU
       B960:PRINTLEFT$(NU$,1)
BC 750 XP=I+3:YP=1:GOSUB960:PR
       INTRIGHT$(NU$,1):NEXT:R
       ETURN
SD 760 REM - INPUT WORDS -
BS 770 INPUT"{CLR}{DOWN}HOW MA
       NY WORDS (MAXIMUM OF 20
       )";NW:PRINT:IFNW<1ORNW>
       20THEN770
EQ 780 PRINT"{CLR}ENTER EACH W
       ORD BETWEEN 3 AND"Q
RR 790 PRINT"CHARACTERS IN LEN
       GTH:{DOWN}":FORI=1TONW
SP 800 PRINTI"> ";:INPUTW$(I)
QA 810 IFLEN(W$(I))<3ORLEN(W$(
       I))>QTHENPRINTCHR$(13)"
       {3 UP}":GOTO800
FK 820 NEXT:RETURN
HX 830 REM - SET UP VARIABLES
       {SPACE}-
KD 840 DIMA$(20,20),W$(20),PX(
       20),PY(20),DX(8),DY(8),
       TW(20),T(20)
JQ 850 FORI=1TO8:READDX(I),DY(
       I):NEXT:BS$(0)="SMALL
       {2 SPACES}":BS$(1)="BIG
       {4 SPACES}":RETURN
CX 860 DATA 0,-1,1,-1,1,0,1,1,
       0,1,-1,1,-1,0,-1,-1
CE 870 REM - SUBROUTINES -
CA 880 GOSUB1070:GOSUB970
XX 890 FORX1=1TONW:FORI=0TOLEN
       (W$(X1))-1
GP 900 XP=3+PX(X1)+I*DX(TW(X1)
       ):YP=2+PY(X1)+I*DY(TW(X
       1)):GOSUB960:PRINT"
       {RVS}{GRN}";
EQ 910 PRINTMID$(W$(X1),I+1,1)
SR 920 GOSUB1030
MM 930 NEXT:XP=25:YP=2+X1:GOSU
       B960:PRINTW$(X1):NEXT
GP 940 POKENDX,0:FORPS=1TO5000
       :NEXT
EK 950 PRINT"{CLR}{9 DOWN}"TAB
       (7)"YOU DIDN'T FINISH I
       N TIME.":GOTO990
QG 960 POKEYR,XP:POKEXR,YP:SYS
       PL:RETURN
KC 970 PRINT"{CLR}":XP=14:YP=1
       2:GOSUB960:PRINT"{RVS}
       {RED}YOU DID IT!!"
DX 980 IFTL=1THENPRINT"
       {2 DOWN}{23}{8 SPACES}
       {RVS}AND YOU FINISHED I
       N TIME!"
JF 990 XP=6:YP=17:GOSUB960:PRI
       NT"{4 DOWN}{RED}PRESS
       {RVS}SPACE BAR{OFF} TO
       {SPACE}PLAY AGAIN"
XS 1000 GETA$:IFA$=" "THENRUN
ER 1010 IFA$<>""THENPRINT"
       {CLR}":END
JR 1020 GOTO1000
KM 1030 IFPEEK(65530)=164THENV
       OL7:SOUND3,1000,5:RETU
       RN
XF 1040 POKES+5,64:POKES+6,0:P
       OKES+24,15:POKES+1,100
       :POKES,0:POKES+4,129
GH 1050 FORN=1TO22:NEXT:POKES+
       4,0:RETURN
GA 1060 POKEYR,27:POKEXR,1:SYS
       PL:PRINT"{12 SPACES}":
       RETURN
JE 1070 FORI=1TO1000:NEXT:RETU
       RN
```

BEFORE TYPING . . .

Before typing in programs, please refer to "How To Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

Power BASIC: Power Pause

Article on page 74.

Program 1: Power Pause—64 Version

```
KC 10 REM COPYRIGHT 1987 COMPU
      TE! PUBLICATIONS, INC. -
       ALL RIGHTS RESERVED
BB 20 PRINT"{CLR}{BLK}
      {3 SPACES}COPYRIGHT 1987
       COMPUTE! PUB., INC."
KM 30 PRINTTAB(10)"ALL RIGHTS
      {SPACE}RESERVED{DOWN}"
MQ 40 FORJ=52992TO53104:READA:
      X=X+A:POKEJ,A:NEXTJ:READ
      A:POKE53105,A
MD 50 FORJ=53106TO53109:READA:
      X=X+A:POKEJ,A:NEXTJ:READ
      A:POKE53110,A
DJ 60 FORJ=53111TO53114:READA:
      X=X+A:POKEJ,A:NEXTJ:READ
      A:POKE53115,A
KC 65 FORJ=53116TO53215:READA:
      X=X+A:POKEJ,A:NEXTJ
AR 70 IFX<>25623THENPRINT"ERRO
      R IN DATA STATEMENTS.":S
      TOP
AD 80 SYS 52992
EM 90 PRINT " POWER PAUSE ACTI
      VATED"
DC 100 PRINT " TO PAUSE, HIT S
       HIFT LOCK/RESTORE"
HA 110 PRINT " TO UNPAUSE, REL
       EASE THE SHIFT LOCK KEY
       "
HB 120 DATA 120,173,0,3,141,12
       9,207,173,1,3,141,130,2
       07,173,22,3
SA 130 DATA 141,156,207,173,23
       ,3,141,161,207,173,38,3
       ,141,144,207,173
QK 140 DATA 39,3,141,145,207,1
       73,24,3,141,218,207,173
       ,25,3,141,219
HF 150 DATA 207,169,66,141,0,3
       ,169,207,141,1,3,169,0,
       141,222,207
MD 160 DATA 88,96,72,169,131,1
       41,38,3,169,207,141,39,
       3,169,155,141
FK 170 DATA 17,208,173,0,221,4
       1,252,9,3,141,0,221,173
       ,24,208,41
MB 180 DATA 2,9,20,141,24,208,
       169,8,141,22,208,169,4,
       141,136,2
AM 190 DATA 169
BF 200 DATA 11:REM BORDER COLO
       R
XX 210 DATA 141,32,208,169
GJ 220 DATA 12:REM BACKGROUND
       {SPACE}COLOR
MR 230 DATA 141,33,208,169
JD 240 DATA 0:REM TEXT COLOR
PX 250 DATA 141,134,2,104
CE 260 DATA 76,0,0,72,169,146,
       141,24,3,169,207,141,25
       ,3,104,76
RC 270 DATA 0,0,72,173,222,207
       ,208,68,238,222,207,169
       ,0,141,22,3
BA 280 DATA 169,0,141,23,3,165
       ,1,72,169,55,133,1,169,
       253,141,0
HF 290 DATA 220,173,1,220,234,
       205,1,220,208,247,201,1
       27,208,13,173,1
CP 300 DATA 220,234,205,1,220,
       208,247,201,255,208,243
       ,169,0,141,222,207
SK 310 DATA 169,127,141,0,220,
       104,133,1,104,76,0,0,10
       4,64,0,170
```

Program 2: Power Pause—128 Version

```
KC 10 REM COPYRIGHT 1987 COMPU
      TE! PUBLICATIONS, INC. -
       ALL RIGHTS RESERVED
JR 20 BANK15:PRINT"{CLR}{BLK}
      {3 SPACES}COPYRIGHT 1987
       COMPUTE! PUB., INC."
KM 30 PRINTTAB(10)"ALL RIGHTS
      {SPACE}RESERVED{DOWN}"
GC 40 FORJ=6912TO7043:READA:X=
      X+A:POKEJ,A:NEXTJ:READA:
      POKE7044,A:FORJ=7045TO70
      52:READA:X=X+A:POKEJ,A:N
      EXTJ:READA:POKE7053,A
KD 50 FORJ=7054TO7056:READA:X=
      X+A:POKEJ,A:NEXTJ:READA:
      POKE7057,A:FORJ=7058TO71
      61:READA:X=X+A:POKEJ,A:N
      EXTJ
CR 60 IFX<>27235THENPRINT"ERRO
      R IN DATA STATEMENTS.":S
      TOP
```

```
QX 70 SYS6912
BK 80 PRINT " POWER PAUSE ACTI
      VATED"
KF 90 PRINT " TO PAUSE, HIT SH
      IFT LOCK/RESTORE"
DB 100 PRINT " TO UNPAUSE, REL
       EASE THE SHIFT LOCK KEY
       "
SQ 110 DATA 120,173,0,3,141,15
       9,27,173,1,3,141,160,27
       ,173,22,3
EQ 120 DATA 141,185,27,173,23,
       3,141,190,27,173,38,3,1
       41,174,27,173
ME 130 DATA 39,3,141,175,27,17
       3,24,3,141,236,27,173,2
       5,3,141,237
CK 140 DATA 27,169,66,141,0,3,
       169,27,141,1,3,169,0,14
       1,248,27
MH 150 DATA 88,96,72,169,161,1
       41,38,3,169,27,141,39,3
       ,169,0,141
KS 160 DATA 0,255,133,216,133,
       217,173,0,221,41,252,9,
       3,141,0,221
FX 170 DATA 173,44,10,41,2,9,2
       0,141,44,10,169,4,141,6
       ,213,169
DG 180 DATA 27,141,17,208,169,
       200,141,22,208,169,252,
       141,48,208,169,26
BH 190 DATA 141,0,214,169
BF 200 DATA 11:REM BORDER COLO
       R
EP 210 DATA 141,32,208,165,241
       ,41,128,9
AC 220 DATA 0:REM TEXT COLOR
KB 230 DATA 133,241,169
XH 240 DATA 12:REM BACKGROUND
       {SPACE}COLOR
GS 250 DATA 141,33,208,44,0,21
       4,16,251,141,1,214,104,
       76,0
RD 260 DATA 0,72,169,176,141,2
       4,3,169,27,141,25,3,104
       ,76,0,0
AA 270 DATA 173,248,27,208,57,
       238,248,27,169,0,141,22
       ,3,169,0,141
JP 280 DATA 23,3,169,253,141,0
       ,220,173,1,220,234,205,
       1,220,208,247
AF 290 DATA 201,127,208,13,173
       ,1,220,234,205,1,220,20
       8,247,201,255,208
SX 300 DATA 243,169,0,141,248,
       27,169,127,141,0,220,76
       ,0,0,104,141
EC 310 DATA 0,255,104,168,104,
       170,104,64,95,170
```

Instant 80

See instructions in article on page 76 before typing in.

```
2500:78 A9 CC 8D B1 09 A9 27 8F
2508:8D A9 09 A9 2D 8D 79 17 E8
2510:A9 25 8D 7A 17 A9 79 8D B1
2518:80 18 A9 25 8D 81 18 A9 7C
2520:97 8D 26 03 A9 25 8D 27 B2
2528:03 58 4C 88 09 48 A5 BA 8B
2530:C9 03 D0 41 A9 3B 8D 11 B4
2538:D0 A9 38 8D 18 D0 A9 94 21
2540:8D 00 DD 8D B4 26 A9 E0 58
2548:8D 50 25 A9 00 AA 9D 00 92
2550:E0 E8 D0 FA EE 50 25 D0 E2
2558:F5 A9 9F 9D 00 CC 9D 00 44
2560:CD 9D 00 CE 9D 00 CF E8 5B
2568:D0 F1 8E B8 26 8E B2 26 EB
2570:A9 FE 8D B3 26 68 4C 4A F1
2578:F3 48 AD B4 26 F0 14 A9 96
2580:17 8D 18 D0 A9 1B 8D 11 AF
2588:D0 A9 97 8D 00 DD A9 00 3C
2590:8D B4 26 68 4C 91 F2 48 F0
2598:AD B4 26 D0 04 68 4C CA DD
25A0:F1 78 68 48 8D B5 26 A5 C8
25A8:01 48 8A 48 98 48 AD B5 52
25B0:26 C9 0D D0 03 4C 73 26 85
25B8:29 E0 F0 04 C9 80 D0 03 23
25C0:4C 5D 26 4A 4A 4A 4A 4A 4C
25C8:AA BD AA 26 18 6D B5 26 97
25D0:A6 C7 F0 02 09 80 A6 FE 35
25D8:8E B6 26 A6 FF 8E B7 26 17
25E0:A2 1B 86 FF 0A 26 FF 0A 07
25E8:26 FF 0A 26 FF 85 FE A9 A7
25F0:33 85 01 A0 07 A2 07 A9 DA
25F8:00 99 B9 26 B1 FE 4A 7E DF
2600:B9 26 4A 4A 7E B9 26 4A 12
2608:4A 7E B9 26 4A 4A 7E B9 E4
2610:26 CA 88 10 E2 AD B8 26 99
2618:F0 0F A2 07 BD B9 26 4A D0
2620:4A 4A 4A 9D B9 26 CA 10 53
2628:F3 A9 34 85 01 AD B2 26 02
2630:85 FE AD B3 26 85 FF F0 28
2638:24 A0 07 B9 B9 26 11 FE C2
2640:91 FE 88 10 F6 AD B8 26 2D
2648:49 01 8D B8 26 D0 0E AD F4
2650:B2 26 18 69 08 8D B2 26 1B
2658:90 03 EE B3 26 AD B6 26 42
2660:85 FE AD B7 26 85 FF 68 10
2668:A8 68 AA 68 85 01 58 68 48
2670:4C CA F1 A9 34 85 01 A2 CA
2678:E0 8E 87 26 E8 8E 84 26 DC
2680:A2 00 BD 40 E0 9D 00 E0 38
2688:E8 D0 F7 EE 87 26 EE 84 A2
2690:26 D0 EF 8E B2 26 A9 FE 8B
2698:8D B3 26 8A 9D 00 FE 9D 8E
26A0:40 FE E8 D0 F7 8D B8 26 84
26A8:F0 B3 00 00 C0 E0 00 C0 A4
26B0:80 80 00 00 00 00 00 00 5D
26B8:00 00 00 00 00 00 00 00 05
26C0:00 20 00 00 00 00 00 00 15
```

Grafnastics

See instructions in article on page 88 before typing in.

Program 1: Grafnastics

```
C000:A9 5C 85 38 20 9B B7 E0 61
C008:00 D0 03 4C 0C C6 E0 01 21
C010:D0 03 4C 49 C2 E0 02 D0 47
C018:03 4C BD C3 E0 03 D0 03 D9
C020:4C 59 C3 E0 04 D0 03 4C 5A
C028:86 C4 E0 05 D0 03 4C 07 BC
C030:C5 E0 06 D0 03 4C 21 C4 EA
C038:E0 07 D0 03 4C 92 C5 E0 4F
C040:08 D0 03 4C EB C0 E0 09 4C
C048:D0 03 4C C5 C0 E0 0A D0 47
C050:03 4C 9E C0 E0 0B D0 03 1E
C058:4C 8B C0 E0 0C D0 03 4C FE
C060:2D C1 60 D0 D2 CF C7 D2 3A
C068:C1 CD A0 C2 D9 A0 D2 CF 45
C070:C2 C5 D2 D4 A0 C2 C9 D8 E8
C078:C2 D9 A9 00 85 FD 85 FB 32
C080:A9 60 85 FC A9 E0 85 FE 4A
C088:A0 00 60 20 7A C0 B1 FB 9E
C090:91 FD C8 D0 F9 E6 FC E6 CC
C098:FE A5 FE D0 F1 60 20 7A BB
C0A0:C0 20 EB C0 20 10 C1 78 51
C0A8:A5 01 29 FC 85 01 B1 FD C3
C0B0:91 FB C8 D0 F9 E6 FC E6 6C
C0B8:FE A5 FE D0 F1 A5 01 09 41
C0C0:03 85 01 58 60 AD 02 DD 66
C0C8:09 03 8D 02 DD AD 00 DD E4
C0D0:29 FC 09 03 8D 00 DD A9 49
C0D8:15 8D 18 D0 A9 1B 8D 11 3E
C0E0:D0 A9 00 85 C6 A9 00 8D F7
C0E8:15 D0 60 AD 02 DD 09 03 AC
C0F0:8D 02 DD AD 00 DD 29 FC 17
C0F8:09 02 8D 00 DD AD 18 D0 D7
C100:29 0F 09 78 8D 18 D0 AD A0
C108:11 D0 09 20 8D 11 D0 60 1E
C110:A9 5C 85 FC A9 00 85 FB 54
C118:A0 00 A2 00 A9 01 91 FB B0
C120:C8 C0 00 D0 F9 E6 FC E8 93
C128:E0 04 90 F2 60 20 88 C5 B8
C130:A9 60 85 FC A0 00 A2 00 6B
C138:A9 00 85 FB 91 FB C8 C0 CF
C140:00 D0 F9 E8 E6 FC E0 20 D2
C148:90 F2 60 AD 34 C2 4A AD A6
C150:33 C2 6A 4A 4A 8D 35 C2 C5
C158:AD 36 C2 4A 4A 4A 8D 37 0B
C160:C2 AD 36 C2 29 07 8D 38 5C
C168:C2 AE 37 C2 A9 00 8D 39 AD
C170:C2 8D 3A C2 E0 00 F0 15 2A
C178:AD 39 C2 18 69 40 8D 39 9B
C180:C2 90 03 EE 3A C2 EE 3A CD
C188:C2 CA 4C 74 C1 8E 30 C2 5C
C190:8E 31 C2 AD 35 C2 18 0A C9
C198:0A 0A 90 03 EE 31 C2 18 BF
C1A0:6D 38 C2 8D 30 C2 90 03 CA
C1A8:EE 31 C2 AD 39 C2 18 6D 95
C1B0:30 C2 8D 30 C2 90 03 EE FE
C1B8:31 C2 AD 3A C2 18 6D 31 61
C1C0:C2 8D 31 C2 A9 60 18 6D C7
C1C8:31 C2 8D 31 C2 AD 33 C2 50
C1D0:29 07 8D 32 C2 A9 07 38 82
C1D8:ED 32 C2 8D 32 C2 A9 01 02
C1E0:A2 00 EC 32 C2 F0 05 0A 64
C1E8:E8 4C E2 C1 8D 2E C2 AD C4
C1F0:31 C2 85 22 AD 30 C2 85 C9
C1F8:21 A0 00 AD 2F C2 F0 0C 82
C200:C9 02 F0 1A B1 21 0D 2E 05
C208:C2 91 21 60 A9 00 8D 3B 21
C210:C2 85 02 B1 21 2D 2E C2 90
C218:8D 3B C2 85 02 60 AD 2E FE
C220:C2 49 FF 8D 2E C2 B1 21 33
C228:2D 2E C2 91 21 60 00 00 CB
C230:00 00 00 00 00 00 00 00 B5
C238:00 00 00 00 00 00 00 00 BD
C240:00 00 00 00 00 00 00 00 C5
C248:00 20 88 C5 A9 C7 8D 3F 0A
C250:C2 A9 00 8D 48 C2 8D 40 23
C258:C2 8D 41 C2 A9 63 8D 3C 29
C260:C2 A9 00 8D 3D C2 8D 3E D8
C268:C2 AD 3F C2 8D 36 C2 AD 47
C270:40 C2 8D 33 C2 AD 41 C2 BD
C278:8D 34 C2 A9 00 8D 2F C2 1C
C280:20 4B C1 AD 3B C2 F0 0E D0
C288:20 06 C3 A9 01 8D 2F C2 12
C290:20 4B C1 4C A1 C2 20 06 54
C298:C3 A9 02 8D 2F C2 20 4B 93
C2A0:C1 EE 3D C2 AD 3D C2 D0 4F
C2A8:05 A9 01 8D 3E C2 C9 40 E4
C2B0:D0 1A AD 3E C2 F0 15 A9 6C
C2B8:00 8D 3D C2 8D 3E C2 CE 2F
C2C0:3C C2 AD 3C C2 C9 FF D0 9C
C2C8:03 4C 05 C3 EE 40 C2 EE AC
C2D0:40 C2 AD 40 C2 D0 05 A9 ED
C2D8:01 8D 41 C2 C9 40 D0 22 A9
C2E0:AD 41 C2 F0 1D A9 00 8D 12
C2E8:40 C2 8D 41 C2 EE 48 C2 2A
C2F0:AD 48 C2 C9 02 90 0B A9 66
C2F8:00 8D 48 C2 CE 3F C2 CE DE
C300:3F C2 4C 69 C2 60 AD 3C 27
C308:C2 8D 36 C2 AD 3D C2 8D BC
C310:33 C2 AD 3E C2 8D 34 C2 F2
C318:60 A9 60 85 FE 85 FC A9 50
C320:00 85 FB A9 A0 85 FD A2 DC
C328:00 8E 48 C2 60 A9 01 8D C1
C330:43 C2 A9 80 8D 44 C2 A9 F3
C338:00 8D 45 C2 AD 42 C2 2D 21
C340:43 C2 F0 09 AD 45 C2 0D DD
C348:44 C2 8D 45 C2 0E 43 C2 40
C350:4E 44 C2 90 E7 AD 45 C2 B4
C358:60 20 88 C5 20 19 C3 A0 13
C360:00 8C 47 C2 A0 98 8C 46 E6
C368:C2 AC 46 C2 B1 FD 8D 42 54
C370:C2 20 2D C3 AC 47 C2 91 DC
C378:FB AD 47 C2 18 69 08 8D 82
C380:47 C2 AD 46 C2 38 E9 08 49
C388:8D 46 C2 B0 DC E6 FB E6 2D
C390:FD E8 E0 08 90 C9 A2 00 DE
C398:A5 FB 18 69 38 85 FB 90 EB
```

```
C3A0:02 E6 FC E6 FC A5 FD 18 83
C3A8:69 38 85 FD 90 02 E6 FE DC
C3B0:E6 FE EE 48 C2 AD 48 C2 ED
C3B8:C9 19 90 A3 60 20 88 C5 12
C3C0:20 19 C3 A0 00 8C 47 C2 A4
C3C8:A0 98 8C 46 C2 AC 46 C2 D4
C3D0:B1 FB 8D 42 C2 20 2D C3 BA
C3D8:AC 47 C2 91 FD AD 47 C2 F1
C3E0:18 69 08 8D 47 C2 AD 46 8F
C3E8:C2 38 E9 08 8D 46 C2 B0 59
C3F0:DC E6 FB E6 FD E8 E0 08 EB
C3F8:90 C9 A2 00 A5 FB 18 69 46
C400:38 85 FB 90 02 E6 FC E6 1C
C408:FC A5 FD 18 69 38 85 FD EF
C410:90 02 E6 FE E6 FE EE 48 88
C418:C2 AD 48 C2 C9 19 90 A3 1B
C420:60 20 88 C5 A9 60 85 FC 26
C428:A9 7F 85 FE A9 00 85 FB 5B
C430:A9 3F 85 FD A0 00 B1 FB 53
C438:8D 42 C2 20 2D C3 8D 48 4F
C440:C2 B1 FD 8D 42 C2 20 2D BA
C448:C3 91 FB AD 48 C2 91 FD E0
C450:A5 FD 38 E9 01 85 FD B0 9C
C458:02 C6 FE A5 FB 18 69 01 E2
C460:85 FB 90 02 E6 FC A5 FC 51
C468:C9 6F 90 CA A5 FB C9 A0 C2
C470:90 C4 60 AD 3D C2 8D 33 9D
C478:C2 AD 3E C2 8D 34 C2 AD 33
C480:3C C2 8D 36 C2 60 20 88 4E
C488:C5 A9 00 8D 40 C2 8D 41 A1
C490:C2 8D 3D C2 8D 3E C2 A9 47
C498:00 8D 3F C2 A9 C7 8D 3C 5D
C4A0:C2 AD 40 C2 8D 33 C2 AD 97
C4A8:41 C2 8D 34 C2 AD 3F C2 86
C4B0:8D 36 C2 A9 00 8D 2F C2 D8
C4B8:20 4B C1 AD 3B C2 F0 0E 0D
C4C0:20 73 C4 A9 01 8D 2F C2 C9
C4C8:20 4B C1 4C D9 C4 20 73 C7
C4D0:C4 A9 02 8D 2F C2 20 4B 50
C4D8:C1 EE 3F C2 CE 3C C2 AD AD
C4E0:3F C2 CD 3C C2 90 BA EE F4
C4E8:3D C2 EE 40 C2 AD 3D C2 AD
C4F0:D0 0B A9 01 8D 41 C2 8D 6F
C4F8:3E C2 4C 97 C4 C9 40 D0 F3
C500:96 AD 3E C2 F0 91 60 20 E4
C508:88 C5 A9 00 8D 40 C2 8D FE
C510:41 C2 8D 3D C2 8D 3E C2 FD
C518:A9 C7 8D 3F C2 A9 00 8D 5A
C520:3C C2 AD 40 C2 8D 33 C2 A9
C528:AD 41 C2 8D 34 C2 AD 3F 53
C530:C2 8D 36 C2 A9 00 8D 2F 0B
C538:C2 20 4B C1 AD 3B C2 F0 83
C540:0E 20 73 C4 A9 01 8D 2F 31
C548:C2 20 4B C1 4C 5A C5 20 3A
C550:73 C4 A9 02 8D 2F C2 20 EA
C558:4B C1 CE 3F C2 EE 3C C2 D4
C560:AD 3C C2 CD 3F C2 90 BA E7
C568:EE 3D C2 EE 40 C2 AD 3D A7
C570:C2 D0 0B A9 01 8D 41 C2 11
C578:8D 3E C2 4C 18 C5 C9 40 23
C580:D0 96 AD 3E C2 F0 91 60 11
C588:20 EB C0 20 10 C1 20 8B 8C
C590:C0 60 20 88 C5 20 19 C3 C5
C598:A0 00 8C 47 C2 A0 98 8C D0
C5A0:46 C2 AC 46 C2 B1 FD 8D 60
C5A8:42 C2 20 2D C3 8D 3B C2 6A
C5B0:AC 47 C2 B1 FB 8D 42 C2 35
C5B8:20 2D C3 AC 46 C2 91 FD 41
C5C0:AC 47 C2 AD 3B C2 91 FB AB
C5C8:AD 47 C2 18 69 08 8D 47 A4
C5D0:C2 AD 46 C2 38 E9 08 8D 25
C5D8:46 C2 B0 C6 E6 FB E6 FD AD
C5E0:E8 E0 08 90 B3 A2 00 A5 F0
C5E8:FB 18 69 38 85 FB 90 02 68
C5F0:E6 FC E6 FC A5 FD 18 69 9A
C5F8:38 85 FD 90 02 E6 FE E6 5B
C600:FE EE 48 C2 AD 48 C2 C9 DB
C608:19 90 8D 60 A2 00 8E 21 51
C610:D0 8E 20 D0 20 C5 C0 BD 12
C618:24 C6 F0 07 20 D2 FF E8 2D
C620:4C 17 C6 60 93 99 0D 0D A2
C628:43 4F 50 59 52 49 47 48 59
C630:54 20 31 39 38 37 20 43 CB
C638:4F 4D 50 55 54 45 21 0D 27
C640:0D 0D 81 30 20 20 48 45 22
C648:4C 50 0D 31 20 20 50 45 2C
C650:52 53 50 45 43 54 49 56 8E
C658:45 0D 32 20 20 4D 49 52 2F
C660:52 4F 52 20 52 5F 4C 0D EC
C668:33 20 20 4D 49 52 52 4F F7
C670:52 20 4C 5F 52 0D 34 20 FD
C678:20 4D 49 52 52 4F 52 20 4C
C680:42 5F 54 0D 35 20 20 4D 1A
C688:49 52 52 4F 52 20 54 5F A9
C690:42 0D 36 20 20 49 4E 56 64
C698:45 52 54 0D 37 20 20 46 79
C6A0:4C 49 50 0D 38 20 20 48 4C
C6A8:49 52 45 53 0D 39 20 20 FA
C6B0:4C 4F 52 45 53 0D 31 30 38
C6B8:20 52 45 43 41 4C 4C 0D A8
C6C0:31 31 20 41 52 43 48 49 C4
C6C8:56 45 0D 31 32 20 43 4C 6C
C6D0:45 41 52 0D 00 00 00 00 6C
```

Program 2: Sample Sketcher

```
MG 10 IFK=0THENK=1:LOAD"GRAFNA
      STICS",8,1
SX 20 POKE53281,0:POKE53280,0:
      A=49152:A$="M":GOTO200
MJ 30 A=49152:A$="":GETA$:IFA$
      =""THEN210
QH 40 IFA$="H"THENSYSA,8
DS 50 IFA$="T"THENSYSA,9
AK 60 IFA$="R"THENSYSA,7
MH 70 IFA$="I"THENSYSA,6
GD 80 IFA$=CHR$(145)THENSYSA,5
EC 90 IFA$=CHR$(17)THENSYSA,4
XM 100 IFA$=CHR$(157)THENSYSA,
      3
SK 110 IFA$=CHR$(29)THENSYSA,2
DE 120 IFA$="P"THENSYSA,1
BR 130 IFA$="L"THEN310
BH 140 IFA$="S"THEN320
MD 150 IFA$="0"THENPOKE49711,0
MQ 160 IFA$="1"THENPOKE49711,1
MK 170 IFA$="2"THENPOKE49711,2
FP 180 IFA$="C"THENSYSA,12
SF 190 IFA$="U"THENSYSA,10
XQ 200 IFA$="M"THENSYSA,9:GOSU
      B380:GOTO30
AF 210 N=(PEEK(56320)AND15):IF
      N=15THEN30
GM 220 X=X+((N>8)AND(N<12))-((
      N<8)AND(N>4))
QR 230 Y=Y-(N=13)-(N=9)-(N=5)+
      (N=14)+(N=10)+(N=6)
KF 240 X=X-(X<0)+(X>319):Y=Y-(
      Y<0)+(Y>199):X2=X
BR 250 X1=-(X>255):POKE49716,X
      1:IFX1=1THENX2=X2-256
GS 260 POKE49715,X2
AF 270 POKE49718,Y
SP 280 SYS49483
ES 290 IFPEEK(49711)=0THENSYS4
      9152,9:PRINTX,Y,PEEK(2)
DF 300 GOTO30
HE 310 K=1:SYSA,11:SYSA,9:INPU
      T"{CLR}LOAD FILENAME";N
      A$:SYSA,8:LOADNA$,8,1
CH 320 SYSA,9:INPUT"{CLR}SAVE
      {SPACE}FILENAME";NA$:IF
      NA$=CHR$(13)THEN30
GS 330 PRINT"{2 DOWN}PLEASE WA
      IT..."
CJ 340 OPEN15,8,15:OPEN8,8,8,"
      0:"+NA$+",P,W":PRINT#8,
      CHR$(0)CHR$(92);
RG 350 FORI=23552TO32575:INPUT
      #15,E1$,E2$
BC 360 IFE1$="00"THENPRINT#8,C
      HR$(PEEK(I));:NEXT
XJ 370 PRINTE1$,E2$:FORI=0TO10
      00:NEXT:CLOSE8:CLOSE15:
      GOTO30
RA 380 PRINT"{CLR}{CYN}
      {2 SPACES}COPYRIGHT 198
      7 COMPUTE! PUB., INC."
QH 390 PRINTTAB(10)"ALL RIGHTS
       RESERVED{DOWN}"
DX 400 PRINT"{RVS}M{OFF} MENU"
GP 410 PRINT"{RVS}0{OFF} PEEK"
FH 420 PRINT"{RVS}1{OFF} DRAW"
HA 430 PRINT"{RVS}2{OFF} ERASE
      "
HS 440 PRINT"{RVS}H{OFF} HI-RE
      S"
QK 450 PRINT"{RVS}P{OFF} PERSP
      ECTIVE"
FP 460 PRINT"{RVS}R{OFF} ROTAT
      E"
XF 470 PRINT"{RVS}T{OFF} TEXT"
KM 480 PRINT"{RVS}U{OFF} UNDO"
PB 490 PRINT"{RVS}I{OFF} INVER
      T"
DC 500 PRINT"{RVS}S{OFF} SAVE"
HX 510 PRINT"{RVS}L{OFF} LOAD"
ED 520 PRINT"{RVS}C{OFF} CLEAR
       SCREEN"
MM 530 PRINT"{RVS}CRSR-LT{OFF}
       MIRROR R TO L"
QF 540 PRINT"{RVS}CRSR-RT{OFF}
       MIRROR L TO R"
EX 550 PRINT"{RVS}CRSR-DN{OFF}
       MIRROR T TO B"
PG 560 PRINT"{RVS}CRSR-UP{OFF}
       MIRROR B TO T"
JM 570 RETURN
```

BEFORE TYPING . . .

Before typing in programs, please refer to "How To Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

PrintScreen

See instructions in article on page 93 before typing in.

Program 1: PrintScreen

```
0801:0B 08 0A 00 9E 32 30 36 2E
0809:32 00 00 00 00 A0 00 B9 6E
0811:34 0A D9 04 CF D0 1E C8 FF
0819:C0 0F D0 F3 EA A0 00 B9 3A
0821:04 CF 99 34 0A C8 C0 37 C9
0829:D0 F5 A2 75 A0 08 20 1B 4B
0831:09 EE 04 CF 60 A0 00 B9 3E
0839:30 09 99 00 CF C8 D0 F7 12
0841:84 FD A2 30 86 FB A2 09 DC
0849:E8 86 FC A9 D8 85 FE 78 FC
0851:A9 30 85 01 A2 07 B1 FB 93
0859:91 FD C8 D0 F9 E6 FC E6 24
0861:FE CA D0 F2 A9 37 85 01 23
0869:58 20 00 CF A2 E0 A0 08 8C
0871:20 1B 09 60 0D 59 4F 55 41
0879:52 20 43 55 53 54 4F 4D 50
0881:20 50 52 49 4E 54 45 52 35
0889:20 53 50 45 43 49 46 49 F1
0891:43 41 54 49 4F 4E 53 0D 1A
0899:48 41 56 45 20 42 45 45 17
08A1:4E 20 49 4E 43 4F 52 50 3B
08A9:4F 52 41 54 45 44 20 49 28
08B1:4E 54 4F 20 54 48 49 53 93
08B9:0D 50 52 4F 47 52 41 4D F6
08C1:2E 20 20 53 41 56 45 20 38
08C9:49 54 20 54 4F 20 44 49 A9
08D1:53 4B 20 41 53 20 55 53 8F
08D9:55 41 4C 2E 0D 0D 00 0D FA
08E1:50 52 49 4E 54 53 43 52 85
08E9:45 45 4E 2D 36 34 20 49 96
08F1:53 20 4E 4F 57 20 41 43 73
08F9:54 49 56 45 2E 0D 54 4F 43
0901:20 50 52 49 4E 54 2C 20 52
0909:55 53 45 20 43 3D 2F 52 05
0911:45 53 54 4F 52 45 2E 0D 2B
0919:0D 00 86 FB 84 FC A0 00 9B
0921:B1 FB F0 0A 20 D2 FF C8 DE
0929:D0 F6 E6 FC D0 F2 60 78 99
```

```
0931:20 8A FF AD 26 03 8D 5F 88
0939:CF AD 27 03 8D 60 CF AD EE
0941:02 03 8D 50 CF AD 03 03 0A
0949:8D 51 CF A9 39 8D 02 03 12
0951:A9 CF 8D 03 03 AD 18 03 10
0959:8D AC CF AD 19 03 8D AD CF
0961:CF A9 00 8D F0 CF 58 60 76
0969:48 A9 52 8D 26 03 A9 CF 8D
0971:8D 27 03 A9 61 8D 18 03 83
0979:A9 CF 8D 19 03 68 4C 00 E9
0981:00 48 A9 61 8D 18 03 A9 6D
0989:CF 8D 19 03 68 4C 00 00 AE
0991:78 48 AD F0 CF D0 42 EE EB
0999:F0 CF 8A 48 98 48 A5 01 20
09A1:48 A9 36 85 01 A9 7F 8D 9C
09A9:00 DC AD 01 DC EA CD 01 E7
09B1:DC D0 F7 C9 DF D0 16 AD 1E
09B9:01 DC EA CD 01 DC D0 F7 D2
09C1:C9 FF D0 F3 20 AE CF 20 8D
09C9:00 C0 20 AE CF 68 85 01 27
09D1:68 A8 68 AA A9 00 8D F0 53
09D9:CF 68 4C 00 00 78 A9 C0 6D
09E1:8D C9 CF 8D D2 CF A9 D8 02
09E9:8D CF CF 8D D8 CF A2 07 DB
09F1:A0 00 A9 30 85 01 B9 00 30
09F9:C0 8D F1 CF B9 00 D8 99 24
0A01:00 C0 AD F1 CF 99 00 D8 D7
0A09:C8 D0 EB EE C9 CF EE CF 5D
0A11:CF EE D2 CF EE D8 CF CA 65
0A19:D0 DC A9 36 85 01 60 00 56
0A21:00 60 60 60 60 60 60 60 05
0A29:60 60 60 60 60 60 60 4C 29
0A31:3B C0 00 60 02 19 60 0A 58
0A39:01 0D 05 13 60 08 0F 13 37
0A41:14 60 00 0E 04 04 03 1B A9
0A49:41 07 00 00 00 00 00 03 C2
0A51:1B 41 0C 00 00 00 00 00 C4
0A59:02 1B 4B 00 00 00 00 00 9E
0A61:00 02 40 01 00 00 00 00 0E
0A69:00 00 EE 20 D0 A5 FB 8D FF
0A71:A5 C0 A5 FC 8D A6 C0 A5 3B
0A79:FD 8D A7 C0 A5 FE 8D A8 DD
0A81:C0 AD 15 D0 8D A9 C0 A9 4F
0A89:00 8D 15 D0 A5 9D 8D AA 1A
0A91:C0 20 BE C0 A9 E0 A0 E0 E4
0A99:A2 20 20 E1 C4 CE 20 D0 9B
0AA1:AD A5 C0 85 FB AD A6 C0 0B
0AA9:85 FC AD A7 C0 85 FD AD B5
0AB1:A8 C0 85 FE AD A9 C0 8D 0E
0AB9:15 D0 AD AA C0 85 9D 60 A4
0AC1:EA EA EA EA EA EA EA EA D5
0AC9:EA EA EA EA EA EA EA EA DD
0AD1:EA EA EA EA EA EA EA EA E5
0AD9:EA EA EA EA EA EA EA EA ED
0AE1:EA EA EA EA EA EA EA EA F5
0AE9:EA EA EA EA EA AD 00 DD 26
0AF1:49 03 0A 0A 0A 0A 0A 0A E3
0AF9:8D 91 C0 AD 18 D0 29 0E 90
0B01:0A 0A 18 6D 91 C0 AA A0 FD
0B09:36 29 7F C9 10 D0 06 A2 83
0B11:D0 A0 32 D0 08 C9 18 D0 73
0B19:04 A2 D8 A0 32 8E 92 C0 B0
0B21:8C 93 C0 AD 18 D0 29 F0 9C
0B29:4A 4A 18 6D 91 C0 8D 94 10
0B31:C0 AD 11 D0 29 20 F0 0F FC
0B39:AD 92 C0 29 E0 A2 20 A0 E7
0B41:E0 20 E1 C4 4C 90 C1 A9 2A
0B49:00 8D 95 C0 8D 96 C0 AD 77
0B51:11 D0 29 40 8D 97 C0 AD 47
0B59:93 C0 85 01 A9 00 85 FD 80
0B61:A9 E0 85 FE AD 95 C0 85 EF
0B69:FB AD 96 C0 18 6D 94 C0 28
0B71:85 FC A0 00 B1 FB AE 97 10
0B79:C0 F0 02 29 3F 84 FC 0A 0F
0B81:26 FC 0A 26 FC 0A 26 FC E6
0B89:85 FB 18 A5 FC 6D 92 C0 42
0B91:85 FC B1 FB 91 FD C8 C0 76
0B99:08 D0 F7 A5 FD 18 69 08 6C
0BA1:85 FD 90 02 E6 FE EE 95 D2
0BA9:C0 D0 03 EE 96 C0 AD 95 4C
0BB1:C0 C9 E8 D0 07 AD 96 C0 A1
0BB9:C9 03 F0 03 4C 35 C1 EA 69
0BC1:A9 36 85 01 AD A9 C0 8D 1E
0BC9:AF C0 AD 1D D0 8D B0 C0 4E
0BD1:AD 17 D0 8D B1 C0 AD 10 73
0BD9:D0 8D B2 C0 A0 00 8C B3 EF
0BE1:C0 A0 00 8C B4 C0 84 FC F7
0BE9:8C B5 C0 8C B6 C0 8C B8 1F
0BF1:C0 8C B7 C0 A9 F8 85 FD C8
0BF9:AD 94 C0 18 69 03 85 FE 07
0C01:AC B3 C0 B1 FD A2 05 0A 1E
0C09:26 FC CA 10 FA 85 FB 18 CB
0C11:A5 FC 6D 91 C0 85 FC 4E 66
0C19:B2 C0 2E B8 C0 4E B0 C0 6D
0C21:2E B6 C0 4E B1 C0 2E B5 9D
0C29:C0 4E AF C0 B0 03 4C B5 17
0C31:C2 AD B3 C0 0A AA BD 00 0F
0C39:D0 38 E9 18 8D B7 C0 AD 01
0C41:B8 C0 E9 00 8D B8 C0 BD B1
0C49:01 D0 38 E9 32 8D 9A C0 79
0C51:EA A0 FF 8C B9 C0 A0 00 E1
0C59:8C BD C0 B1 FB 8D BB C0 A8
0C61:8C BC C0 AD B8 C0 8D 99 5F
0C69:C0 AD B7 C0 8D 98 C0 A0 41
0C71:FF 8C BA C0 C8 8C 9E C0 86
0C79:0E BB C0 2E 9E C0 20 CD 88
0C81:C4 A9 01 18 6D 98 C0 8D E4
0C89:98 C0 A9 00 6D 99 C0 8D 34
0C91:99 C0 EE BA C0 AE BA C0 27
0C99:EC B6 C0 D0 E1 EE BC C0 FF
0CA1:AE BC C0 E0 08 D0 C8 A0 1C
0CA9:00 8C BC C0 AC BD C0 C8 2F
0CB1:B1 FB 8D BB C0 8C BD C0 83
0CB9:C0 03 D0 B3 EE 9A C0 EE 9A
0CC1:B9 C0 AE B9 C0 EC B5 C0 3E
0CC9:D0 8C A9 03 18 65 FB 85 A6
0CD1:FB A9 00 65 FC 85 FC EE 8F
0CD9:B4 C0 AE B4 C0 E0 15 F0 42
0CE1:03 4C 22 C2 EE B3 C0 AE 75
0CE9:B3 C0 E0 08 F0 03 4C B2 87
0CF1:C1 EA A9 00 8D 9B C0 20 57
0CF9:90 FF 78 AD 14 03 8D AB B7
0D01:C0 AD 15 03 8D AC C0 AD 08
0D09:18 03 8D AD C0 AD 19 03 6E
0D11:8D AE C0 A9 95 8D 18 03 66
0D19:8D FA FF 8D FE FF A9 C4 A1
0D21:8D 19 03 8D FB FF 8D FF 7C
0D29:FF A9 A4 8D 14 03 A9 C4 DF
0D31:8D 15 03 AD 14 C0 AE 15 A8
0D39:C0 AC 16 C0 20 BA FF A9 43
0D41:00 20 BD FF 20 C0 FF AE CD
0D49:14 C0 20 C9 FF 20 B7 FF 2E
0D51:29 80 F0 03 4C C9 C3 AD 2D
0D59:17 C0 A2 18 A0 C0 20 80 CD
0D61:C4 AD 29 C0 A2 2A A0 C0 3A
0D69:20 80 C4 AD 32 C0 A2 33 34
0D71:A0 C0 20 80 C4 A9 00 8D 72
0D79:98 C0 8D 99 C0 AD 9B C0 10
0D81:8D 9A C0 A9 00 8D A0 C0 F3
0D89:8D 9D C0 20 B6 C4 4E 9E EF
0D91:C0 2E 9D C0 EE 9A C0 EE A9
0D99:A0 C0 AE A0 C0 E0 07 D0 7C
0DA1:EA 18 2E 9D C0 AE 13 C0 7E
0DA9:F0 13 4E 9D C0 A9 00 A2 F3
0DB1:06 4E 9D C0 2A CA 10 F9 B8
0DB9:09 80 8D 9D C0 AD 9D C0 BC
0DC1:20 D2 FF EE 98 C0 D0 03 FB
0DC9:EE 99 C0 AE 98 C0 E0 40 8E
0DD1:D0 AB AE 99 C0 E0 01 D0 0B
0DD9:A4 A9 0D 20 D2 FF AD 9B E1
0DE1:C0 18 69 07 8D 9B C0 C9 26
0DE9:C8 B0 03 4C 32 C3 AD 20 D5
0DF1:C0 A2 21 A0 C0 20 80 C4 8F
0DF9:AD 14 C0 20 C3 FF 20 CC 35
0E01:FF 78 AD AB C0 8D 14 03 13
0E09:AD AC C0 8D 15 03 AD AD D5
0E11:C0 8D 18 03 AD AE C0 8D 5B
0E19:19 03 60 A9 9F 85 FD A9 E1
0E21:C0 85 FE A9 00 8D 9F C0 AF
0E29:AD 9A C0 C9 C8 B0 10 AD 4E
0E31:99 C0 C9 01 90 0A D0 07 E8
0E39:AD 98 C0 C9 40 90 01 60 AD
0E41:AD 9A C0 4A 4A 4A 8D A1 CF
0E49:C0 AD 99 C0 4A AD 98 C0 6B
0E51:6A 4A 4A 8D A2 C0 AD 9A 65
0E59:C0 29 07 8D A3 C0 AD 98 ED
0E61:C0 49 FF 29 07 8D A4 C0 3B
0E69:A9 01 AE A4 C0 F0 04 0A 96
0E71:CA D0 FC 8D A4 C0 A9 00 1B
0E79:85 FE AD A2 C0 0A 26 FE 71
0E81:0A 26 FE 0A 26 FE 18 6D 77
0E89:A3 C0 85 FD A5 FE 69 E0 15
0E91:85 FE AE A1 C0 F0 10 18 22
0E99:A9 40 65 FD 85 FD A9 01 9F
0EA1:65 FE 85 FE CA D0 F0 78 C4
0EA9:A0 00 A9 35 85 01 60 C9 59
0EB1:00 F0 10 86 FB 84 FC A0 01
0EB9:00 AA B1 FB 20 D2 FF C8 8B
0EC1:CA D0 F7 60 78 48 AD 0D C9
0EC9:DD AD 0D DC A9 8F 8D 19 6F
0ED1:D0 68 40 78 AD 0D DD AD 0B
0ED9:0D DC A9 8F 8D 19 D0 68 BC
0EE1:A8 68 AA 68 40 A9 00 8D 7E
0EE9:9E C0 20 EC C3 B1 FD 2D 66
0EF1:A4 C0 F0 03 EE 9E C0 A9 FB
0EF9:36 85 01 60 AD 9E C0 F0 13
0F01:0A 20 EC C3 B1 FD 0D A4 4A
0F09:C0 91 FD A9 36 85 01 60 70
0F11:85 FC 84 FE A0 00 84 FB BB
0F19:84 FD B1 FB 91 FD C8 D0 D5
0F21:F9 E6 FC E6 FE CA D0 F2 BB
0F29:60 00 00 A0 A0 A0 A0 00 4A
```

Program 2: Printer Changer

```
KC 10 REM COPYRIGHT 1987 COMPU
      TE! PUBLICATIONS, INC. -
      ALL RIGHTS RESERVED
QK 20 PRINTCHR$(14)CHR$(8)"
      {CLR}{3 SPACES}COPYRIGHT
      1987 COMPUTE! PUB., INC
      ."
FD 30 PRINTTAB(10)"ALL RIGHTS
      {SPACE}RESERVED"
EP 40 DIMM(55):PRINT"{6 DOWN}
      {3 SPACES}PARAMETER CHAN
      GER FOR PRINTSCREEN"
RG 50 FORJ=0TO54:READM(J):NEXT
      :FORI=1TO1500:NEXT
PP 60 PRINT"{CLR}IS YOUR PRINT
      ER COMMODORE 1525":PRINT
      "COMPATIBLE (Y/N)";
PM 70 INPUTA$:IFA$<>"Y"ANDA$<>
      "N"THEN70
MJ 80 M(15)=0:IFA$="Y"THENM(15
      )=1
SS 90 PRINT"{DOWN}THE NUMBERS
      {SPACE}IN PARENTHESES IN
      DICATE"
EG 100 PRINT"THE USUAL VALUES
       {SPACE}FOR COMMANDS."
CP 110 PRINT"{DOWN}WHEN PRINTI
       NG, WHAT LOGICAL FILE"
RB 120 PRINT"NUMBER DO YOU USE
        (14)";:INPUTM(16)
CQ 130 PRINT"{DOWN}WHAT IS YOU
       R PRINTER DEVICE":PRINT
       "NUMBER (4)";:INPUTM(17
       )
RS 140 IFM(15)=1THEN340
HX 150 PRINT"{DOWN}WHAT SECOND
       ARY ADDRESS DO YOU WANT
       "
CF 160 PRINT "TO USE FOR TRANS
       PARENT WITH":PRINT"LINE
       FEED (4)";:INPUTM(18)
ES 170 PRINT"{DOWN}WHAT COMMAN
       D IS NEEDED TO SET YOUR
       "
DX 180 PRINT"PRINTER TO 7/72-I
       NCH LINE SPACING?"
XG 190 PRINT"ENTER ONE CODE PE
       R QUESTION MARK."
PH 200 PRINT"AFTER YOU'VE ENTE
       RED ALL VALUES (IE.,"
RF 210 PRINT"27, 65, 7), PRESS
        RETURN TO CONTINUE."
MM 220 I=20:L=19:GOSUB390
JD 230 PRINT"{DOWN}WHAT COMMAN
       D IS NEEDED TO SET YOUR
       "
SM 240 PRINT"PRINTER BACK TO 1
       2/72-INCH LINE"
FS 250 PRINT"SPACING (27, 65,
       {SPACE}12)"
```

```
PD 260 I=29:L=28:GOSUB390
SD 270 PRINT"{DOWN}WHAT COMMAN
       D IS NEEDED TO TURN ON"
AA 280 PRINT"YOUR PRINTER'S DO
       T-COLUMN GRAPHICS"
CH 290 PRINT"MODE (27, 75)?"
GC 300 I=38:L=37:GOSUB390
CP 310 M(46)=2:REM NUMBER OF W
       IDTH-BYTES FOLLOWING GR
       APHIC COMMAND
MX 320 M(47)=64:REM LOW-BYTE O
       F WIDTH NUMBER
AJ 330 M(48)=1:REM HIGH-BYTE O
       F WIDTH NUMBER
PJ 340 FORJ=0TO55:POKE52996+J,
       M(J):NEXT:REM $CF04
PH 350 PRINT"{DOWN}OKAY, YOUR
       {SPACE}PRINTER PARAMETE
       RS HAVE"
JJ 360 PRINT"BEEN STORED IN ME
       MORY.{2 SPACES}NOW, LOA
       D"
JM 370 PRINT"AND RUN PRINTSCRE
       EN. THEN SAVE"
AD 380 PRINT"IT TO DISK UNDER
       {SPACE}A NEW NAME.":END
CD 390 J=0
XR 400 A$=""
HH 410 INPUT" ";A$:IFA$=""THEN
       440
SR 420 M(I+J)=VAL(A$):J=J+1
XS 430 IFJ<8THEN400
AQ 440 M(L)=J:RETURN
CF 450 DATA 96,2,25,96,10,1,13
       ,5,19,96
PJ 460 DATA 8,15,19,20,96
SM 470 DATA 1
QS 480 DATA 14,4,0
GP 490 DATA 1,8,0,0,0,0,0,0,0,0
FD 500 DATA 1,15,0,0,0,0,0,0,0,0
DA 510 DATA 0,0,0,0,0,0,0,0,0,0
XH 520 DATA 0,0,0,0,0,0,0,0,0,0
```

BEFORE TYPING . . .

Before typing in programs, please refer to "How To Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

Root Race

Article on page 44.

Program 1: Booter

```
CB 10 PRINT"{CLR}{3 DOWN}POKE4
      4,64:POKE16384,0:NEW"
BS 20 PRINT"{2 DOWN}LOAD"CHR$(
      34)"ROOT RACE"CHR$(34)",
      8"
KD 30 PRINT"{4 DOWN}RUN{HOME}"
QF 40 POKE198,3:POKE631,13:POK
      E632,13:POKE633,13
```

Program 2: Root Race

```
KC 10 REM COPYRIGHT 1987 COMPU
      TE! PUBLICATIONS, INC. -
       ALL RIGHTS RESERVED
BX 20 IFPEEK(49155)<>14THENGOS
      UB1600
FB 30 DIMA(17,16),SC(17),V(17,
      16):X=RND(-TI)
DS 40 SYS49152:FORT=0TO7:POKE1
      4336+160*8+T,255:NEXT
DA 50 PRINT"{CLR}":FORT=54272T
      O54296:POKET,0:NEXT:POKE
      54296,15
HG 60 POKE53272,31:POKE53281,0
      :POKE53280,11:H=1024:CL=
      54272+H:POKE54278,240
AR 70 POKE53280,0:POKE2040,13:
      POKE54276,17:FC=252:FD=2
      53
CB 80 FORT=0TO127:POKE832+T,0:
      NEXT:FORT=0TO7:READX:POK
      E832+T*3,X:NEXT:POKE5328
      7,1
GC 90 FORT=0TO9:READEF(T):NEXT
      :C(2)=15
KP 100 INPUT"{HOME}{DOWN}{YEL}
       1 OR 2 JOYSTICKS";JN:IF
       JN=1THENPRINT"{CYN}PLUG
        IT IN PORT ONE."
FD 110 IFJN=0ORJN>2THEN100
FB 120 A$="{BLK}{WHT}{RED}
       {CYN}{PUR}{GRN}{BLU}
       {YEL}{f1}{f2}{f3}{f4}{f5}{f6}
       {f7}{f8}"
QS 130 PRINTC$"{HOME}{4 DOWN}
       {RVS}{21 SPACES}{DOWN}"
GQ 140 T=C(2):PRINT"{f7}SELECT
       {SPACE}GROUND COLOR WIT
       H THE SPACE BAR, AND TH
       EN HIT F7.{2 DOWN}"
XE 150 IFPEEK(203)=60THENT=T+1
       :C(2)=T
GE 160 C$=MID$(A$,(15ANDT)+1,1
       ):FORX=1TO30:NEXT:IFPEE
       K(203)<>3THEN130
BK 170 FORT=1TO15:POKEH+364+T*
       2,160:POKECL+364+T*2,T:
       NEXT:POKE198,0
KR 180 INPUT"{DOWN}{f6}PLAYER O
       NE'S ROOT COLOR (1-15)"
       ;C(0):C(0)=C(0)AND15:IF
       C(0)=0THEN180
FJ 190 INPUT"{DOWN}{GRN}PLAYER
        TWO'S ROOT COLOR (1-15
       )";C(1):C(1)=C(1)AND15:
       IFC(1)=0THEN190
QD 200 IFC(0)=C(1)THENPRINT"
       {WHT}THOSE COLORS ARE T
       HE SAME !!":GOTO180
XD 210 POKE198,0:INPUT"{DOWN}
       {YEL}HOW MANY TREES PER
        PLAYER (3-9)";TN:IFTN>
       9ORTN<3THEN210
AQ 220 Q=TN*2:PRINT"{DOWN}
       {WHT}SELECT A GAME: F1=
       TWO PLAYERS"
EA 230 PRINT"{15 SPACES}F3=GAM
       E DEMONSTRATION"
JM 240 PRINT"{15 SPACES}F5=PLA
       YER VS COMPUTER"
HQ 250 GETA$:IFA$=""THEN250
KB 260 IFA$<>"{f1}"ANDA$<>"
       {f3}"ANDA$<>"{f5}"THEN2
       50
MA 270 P$(0)="COMPUTER ONE":P$
       (1)="COMPUTER TWO":IFA$
       ="{f3}"THEN330
GP 280 IFA$="{f5}"THENP$(0)="P
       LAYER 1":P$(1)="COMPUTE
       R":INPUT"{DOWN}{CYN}NAM
       E";P$(0):GOTO330
GP 290 INPUT"{DOWN}{CYN}PLAYER
        ONE'S NAME";P$(0):INPU
       T"{DOWN}{f8}PLAYER TWO'S
        NAME";P$(1)
AH 300 IFP$(0)="COMPUTER ONE"T
       HENP$(0)="PLAYER ONE"
KC 310 IFP$(1)="COMPUTER TWO"T
       HENP$(1)="PLAYER TWO"
GJ 320 P$(0)=LEFT$(P$(0),14):P
       $(1)=LEFT$(P$(1),14)
SK 330 FORT=0TOQ-1:A(T,0)=T+2:
       NEXT
MQ 340 GOSUB1420:POKE53269,1:Q
       Z=0
PA 350 U=56320:U2=56321:F=0
SQ 360 M=0:PRINT"{OFF}"
DX 370 PL=0:CM=A$="{f3}":GOSUB
       1090:IFM=Q-1-RCTHENRC=R
       C+1:M=0:L=0
GF 380 IFRC=Q-2THEN420
GF 390 PL=1:CM=(A$="{f5}"ORA$=
       "{f3}"):GOSUB1090:IFM=Q
       -1-RCTHENRC=RC+1:M=0:L=
       0
KM 400 IFRC=Q-2THEN420
BS 410 GOTO370
JA 420 S1=SC(A(0,Q-2)-2):S2=SC
       (A(1,Q-2)-2):B=(A(0,Q-2
       )AND1):POKEFC,0
BF 430 IFS1>S2ANDB=0THENK=0
CA 440 IFS1>S2ANDB=1THENK=1
RA 450 IFS2>S1ANDB=0THENK=1
AA 460 IFS2>S1ANDB=1THENK=0
EX 470 G$=P$(KAND1)
XQ 480 POKE53269,0:POKE198,0:P
       OKEFD,0:G2$="S":IFABS(S
       1-S2)=1THENG2$=""
XQ 490 FORT=0TO300:NEXT
RJ 500 IFS1<>S2THENPRINT"
       {HOME}{WHT}"SP$"{HOME}T
       HE WINNER IS {YEL}"G$"
       {WHT}, WHOSE ROOT"
BS 510 IFS1=S2THENPRINT"{HOME}
       {CYN}A TIE GAME. {WHT}(
       GOOD DEFENSE BY PLAYER
       {SPACE}2)"
SF 520 IFS1<>S2THENPRINT"
       {HOME}{DOWN}SYSTEM IS"A
       BS(S1-S2)"YARD"G2$" LAR
       GER."
AS 530 READB,D,X:IFB<0THEN550
GP 540 POKE54272,D:POKEFC,B:FO
       RT=1TOX*88:NEXT:GOTO530
XP 550 POKE54272,0:POKEFC,0:RE
       STORE:FORT=1TO18:READX:
       NEXT
HE 560 PRINT"{HOME}{3 DOWN}{f6}
       {4 SPACES}PLAY SAME GAM
       E AGAIN? (Y<< >>N)";
MC 570 IFPEEK(203)=39ORPEEK(U2
       )=247THENPRINT"{CLR}":J
       =1:GOTO600
DS 580 IFPEEK(203)=25ORPEEK(U2
       )=251THENJ=2:GOTO600
PQ 590 GOTO570
FJ 600 PRINT"{CLR}":FORT=0TO17
       :FORX=0TO16:SC(T)=0:A(T
       ,X)=0:NEXT:NEXT:RC=0:LG
       =0
GA 610 ONJGOTO120,330
AF 620 E=0:PRINT"{HOME}
       {27 SPACES}";
PA 630 IFRX+D>Q-RC-2THEN780
RA 640 IFRX+D<0THEN780
RF 650 IFA(RX+D,RC+1)AND1<>0TH
       EN780
PQ 660 B=INT(RND(-TI)*5):POKEF
       D,0:POKEFC,EF(B*2):POKE
       FD,EF(B*2+1)
CH 670 A(RX+D,RC+1)=A(RX,RC):S
       C(A(RX,RC)-2)=SC(A(RX,R
       C)-2)+1:V(RX+D,RC+1)=D+
       2
AD 680 T=INT(RND(0)*3)*4
DC 690 IFDTHEN730
BX 700 IFPEEK(X+H)<>143THENPOK
       EX+H,140+T/4:GOTO720
QK 710 POKEH+X,130+T
DG 720 POKEX+H+1,131+T:POKEX+C
       L,C(PL):POKEX+CL+1,C(PL
       )
BH 730 IFNOTDTHEN770
HF 740 POKEX+H-1,128+T:POKEX+C
       L-1,C(PL):POKEX+CL,C(PL
       )
MB 750 IFPEEK(X+H)<>143THENPOK
       EX+H,140+T/4:GOTO770
JE 760 POKEH+X,129+T
```

```
HJ 770 M=M+1:RETURN
HH 780 E=-1:RETURN
KK 790 POKEFD,0:POKEFC,2:POKE5
       4276,33
XH 800 PRINT"{HOME}{6}NO MOVES
        ARE POSSIBLE FOR "P$(P
       L);:FORT=1TO2000:NEXT
QH 810 POKEFC,0:POKE54276,17:R
       ETURN
KM 820 IFXT>0THENIFA(XT-1,RY)A
       ND1=0ANDA(XT+1,RY)AND1=
       0THENDD=NOTDD
GK 830 IFXT=0THENXT=1:DD=0
CM 840 RETURN
BG 850 FF=0:D=1:IFRX<0THENRX=0
FR 860 IFRC=0ANDF=<TN-2THENF=F
       +1:RX=TN-1:GOTO1120
DC 870 IFF>1ANDRC>0THENRX=INT(
       TN-RY/2)-1:IFRX<0THENRX
       =0
QG 880 FF=-1:IFRY>1THEN920
HG 890 DD=-1:IFRX>0THENIF(-A(R
       X-1,RY)AND1)THENIF-A(RX
       +1,RY)AND1THENRX=RX-1:G
       OTO890
QA 900 IFRX>0THENIF(-A(RX-1,RY
       )AND1)AND(A(RX+1,RY)AND
       1=0)THENDD=0
ER 910 GOTO1120
MJ 920 FORT=0TOTN*2:IF(A(T,1)A
       ND1)=0THENNEXT
BD 930 IFT=TNTHENIF-(TNAND1)TH
       ENCS=-1:TR=TN+2:GOTO980
EJ 940 IFT=TN-1THENIF(TNAND1)=
       0THENCS=-1:TR=TN+3:QZ=-
       1:GOTO970
RR 950 LG=0:FORT=3TOTN*2-5STEP
       2:IFSC(T)>LGTHENLG=SC(T
       ):TR=T+2
JS 960 NEXT:CS=0:IFTR-2>TNTHEN
       CS=-1
MF 970 IFCS=0THEN1040
HM 980 DD=-1:FORT=1TOTN*2-RY-1
       :IFA(T,RY)<>TRTHENNEXT
QR 990 XT=T
RE 1000 IF(RY>TN-1)THENIF(-A(X
        T+1,RY)AND1)AND(A(0,RY
        )AND1=1)THENXT=XT+1
ES 1010 DD=0:GOTO1000
KH 1020 IFQZTHENRX=XT:DD=-1:GO
        TO1120
EC 1030 GOTO1080
JR 1040 D=1:DD=0:FORT=TN*2-RYT
        O1STEP-1:IFA(T,RY)<>TR
        ORA(T,RY+1)>0THENNEXT
PA 1050 XT=T
AQ 1060 IFRY>TN-1ANDXT>0THENIF
        (-A(XT-1,RY)AND1)THENX
        T=XT-1:DD=-1:GOTO1060
FE 1070 IFPEEK(203)=2THENEND
BX 1080 GOSUB820:RX=XT:GOTO112
        0
SB 1090 PRINT"{HOME}{WHT}"SP$;
        "{HOME}"P$(PL)"'S MOVE
        ..";:RX=0:RY=RC:D=1
RB 1100 POKE53269,0:B=0:E=0:FF
        =0:IFCMTHENRX=INT(RND(
        1)*(Q-RY-2))
AB 1110 IFA$="{F5}"ANDPL=1THEN
        850
HJ 1120 IF(RX>Q-RC-1)ANDBTHENR
        X=0
GR 1130 IF(RX<0)ANDBTHENRX=Q-R
        C-1
HK 1140 IFRX>Q-RC-1ANDNOTBTHEN
        E=E+1:RX=0
GK 1150 IFRX<0ANDNOTBTHENE=E+1
        :RX=Q-RC-1
AE 1160 PY=99+RC*8:PX=(CE+RC)*
        8+24+RX*16:IFE>1THEN79
        0
GK 1170 IF(A(RX,RC)AND1)<>PLTH
        ENRX=RX+D:GOTO1120
QX 1180 X=INT((PX-24)/8)+INT((
        PY-50)/8)*40
JR 1190 IFPEEK(X+H+1)<>148ANDP
        EEK(X+H-1)<>148THENRX=
        RX+D:GOTO1120
CD 1200 IFPX>255THENPOKE53264,
        1
GA 1210 IFPX<256THENPOKE53264,
        0
XM 1220 POKE53248,PXAND255:POK
        E53249,PY:B=-1:POKE532
        69,1
RD 1230 IFNOTCMTHEN1270
SK 1240 D=INT(RND(1)*2)-1:IFFF
        THEND=DD
CM 1250 GOSUB620:IFETHEND=INT(
        RND(1)*2)-1:GOTO1250
KS 1260 RETURN
AP 1270 J=1:IFPL=1ANDJN=2THENP
        OKE56322,0:J=0
GG 1280 IF(PEEK(U+J)AND8)=0THE
        NRX=RX+1:D=1:GOTO1100
QM 1290 IF(PEEK(U+J)AND4)=0THE
        NRX=RX-1:D=-1:GOTO1100
HK 1300 POKEU,127
DB 1310 IF(PEEK(U+J)AND16)>0TH
        EN1270
EC 1320 PRINT"{HOME}{OFF}WHICH
         WAY???{19 SPACES}";
DM 1330 D=-2
FK 1340 IF(PEEK(U+J)AND8)=0THE
        ND=0
KE 1350 IF(PEEK(U+J)AND4)=0THE
        ND=-1
KD 1360 POKE56322,255
FH 1370 IFD=-2THEN1340
AD 1380 GOSUB620:IFNOTETHENRET
        URN
JJ 1390 PRINT"{HOME}{5 SPACES}
        {YEL}I M P O S S I B L
         E{3 SPACES}M O V E"
AQ 1400 POKEFD,0:POKE54276,33:
        FORK=0TO5*↑STEP.2:POKE
        FC,ABS(SIN(K)*9)+3:NEX
        T
QR 1410 POKE54276,17:POKEFC,0:
        GOTO1090
FJ 1420 SP$="{40 SPACES}":CE=2
        0-Q:G$="":G2$=""
MX 1430 PRINT"{CLR}{3 DOWN}"SP
        $C$"{DOWN}"
JJ 1440 FORT=2TOCE:G$=G$+" ":N
        EXT:G$=G$+"U"
SF 1450 FORT=1TOCE:G2$=G2$+" "
        :NEXT:G2$="V"+G2$
DQ 1460 D$="OT":FORT=1TOQ-2:D$
        =D$+"OT":NEXT:D$=D$+"O
        "
QP 1470 G$="{RVS}"+G$
HP 1480 X=160+H+CE:X2=160+CL+C
        E:FORT=0TOTN-1:POKEX+T
        *4,147:POKEX2+T*4,C(0)
GJ 1490 POKEX+T*4+40,146:POKEX
        2+T*4+40,C(0):POKEX+T*
        4+2,145:POKEX2+T*4+2,C
        (1)
XH 1500 POKEX+T*4+42,144:POKEX
        2+T*4+42,C(1)
AB 1510 NEXT
DX 1520 FORT=1TOQ-2
DD 1530 PRINTG$"{5}"D$C$G2$;:D
        $=LEFT$(D$,LEN(D$)-2):
        G2$=G2$+" "
AH 1540 G$=" "+G$
EC 1550 NEXT
SG 1560 IFTN<10THENFORT=1TO(10
        -TN)*2:PRINTSP$;:NEXT
GQ 1570 T=(10-TN)*2
PG 1580 FORK=0TO2:POKE56276-K-
        T*40,14:NEXT
AR 1590 PRINT"{HOME}{WHT}";:RE
        TURN
FK 1600 POKE53281,1:POKE53280,
        1:PRINT"{CLR}{13}
        {3 SPACES}COPYRIGHT 19
        87 COMPUTE! PUB., INC.
        "
SD 1610 PRINTTAB(10)"ALL RIGHT
        S RESERVED{6 DOWN}"
RE 1620 PRINTTAB(11)"{RVS}R O
        {SPACE}O T{3 SPACES}R
        {SPACE}A C E{DOWN}"
JG 1630 FORI=1TO350:READA:X=X+
        A:NEXT
CK 1640 IFX<>25073THENPRINT"ER
        ROR IN DATA STATEMENTS
        .":STOP
SM 1650 RESTORE:FORT=1TO66:REA
        DX:NEXT
DP 1660 FORT=0TO99:READX:POKE4
        9152+T,X:NEXT:FORT=0TO
        183:READX:POKE15360+T,
        X:NEXT
AF 1670 RESTORE:RETURN
FR 1680 DATA 24,60,126,255,219
        ,24,24,24,18,70,16,16,
        21,113,18,50,5,131
MF 1690 DATA 16,195,1.5,14,239
        ,1,16,195,1.5,18,209,1
        ,16,195,1.5
PM 1700 DATA 18,209,1,21,31,1.
        5,18,209,1,42,62,1.5,3
        1,165,1,42,62,1.5
BB 1710 DATA 31,165,1,18,209,1
        .5,31,165,1,50,60,2.5,
        -1,-1,-1
CA 1720 DATA 169,0,141,14,220,
        169,251,37,1,133,1,162
        ,0,189,0,208,157,0,56
AG 1730 DATA 189,0,209,157,0,5
        7,232,208,241,165,1,9,
        4,133,1,169,1,141,14
JC 1740 DATA 220,169,27,141,17
        ,208,169,127,141,13,22
        0,169,65,141,20,3,169,
        192,141
DS 1750 DATA 21,3,169,129,141,
        26,208,96,165,252,240,
        5,24,101,253,133,252,1
        41,1
BX 1760 DATA 212,169,1,141,25,
        208,169,0,141,18,208,1
        73,13,220,41,1,240,3,7
        6
RD 1770 DATA 49,234,76,188,254
FF 1780 DATA 0,0,0,3,6,12,24,2
        4,24,24,48,224,0,0,0,0
        ,24,24,48,51,30
FG 1790 DATA 0,0,0,0,0,0,224,4
        8,24,24,24,0,0,0,1,3,6
        ,12,24,24,24,112,192
EM 1800 DATA 0,0,0,0,24,24,12,
        6,3,0,0,0,0
FP 1810 DATA 0,0,192,240,24,24
        ,24,0,0,0,15,24,48,48,
        24,24,112,192,128
QC 1820 DATA 0,0,0,0,24,12,12,
        7,0,0,0,0,0,0,0,0,224,
        48,24
RE 1830 DATA 24,24,24,60,231,1
        29,0,0,0,28,54,99,193,
        0,0,0,0,24,120
DK 1840 DATA 200,203,14,0,0,0,
        0,0,0,0,0,0,0,0,126,24
        ,255,24,255
CG 1850 DATA 24,60,126,0,0,24,
        24,60,24,126,24,255,60
        ,24,24,24,60,126,219
GM 1860 DATA 0,24,60,60,126,12
        6,255,255,0,0,0,56,124
        ,56,0,0,128,192,224
JM 1870 DATA 240,248,252,254,2
        55,1,3,7,15,31,63,127,
        255
```

BEFORE TYPING . . .

Before typing in programs, please refer to "How To Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

Dynamic Screen

Article on page 92.

Program 1: Dynamic Screen

```
KC 10 REM COPYRIGHT 1987 COMPU
      TE! PUBLICATIONS, INC. -
       ALL RIGHTS RESERVED
MK 20 B=53280:BA=B+1:X=211:CY=
      214:XR=781:YR=782:SC=102
      4:CO=54272:CC=646
GH 30 IFPEEK(65530)=5THENBANK1
      5:X=236:CY=235:XR=7:YR=8
      :CC=241
SE 40 IFPEEK(65530)<>164THEN60
AR 50 B=65305:BA=B-4:X=202:CY=
      X+3:XR=2035:YR=2036:SC=3
      072:CO=-1024:CC=1339:P=1
PP 60 PRINTCHR$(8)CHR$(14)"
      {CLR}{3 SPACES}COPYRIGHT
       1987 COMPUTE! PUB., INC
      ."
DQ 70 PRINTTAB(10)"ALL RIGHTS
      {SPACE}RESERVED":FORI=1T
      O2000:NEXT
CJ 80 NA=4:FORT=1TONA:READAY(T
      ),AW(T),AM$(T):NEXT
BK 90 DATA10,13,"EDIT SCREEN",
      11,13,"READ SCREEN"
DM 100 DATA12,13,"DIRECTORY":D
       ATA13,13,"EXIT"
FQ 110 GOSUB280:PRINTTAB(11)"
       {4 DOWN}{WHT}- EDIT SCR
       EEN{5 SPACES}-"
AM 120 PRINTTAB(11)"- READ SCR
       EEN{5 SPACES}-"
SK 130 PRINTTAB(11)"- DIRECTOR
       Y{7 SPACES}-"
RS 140 PRINTTAB(11)"- EXIT
       {12 SPACES}-"
BA 150 PRINTTAB(11)"{Z3}*******
       **********{X3}"
GM 160 PRINTTAB(11)"{6 UP}{A3}*
       ***************{S3}"
QS 170 REM GET COMMANDS
FE 180 A=1
AA 190 W=AW(A):Y=AY(A):GOSUB27
       0:PRINT"{RVS}{WHT}"AM$(
       A)"{OFF}";
CS 200 GETA$:IFA$=""THEN200
FE 210 W=AW(A):Y=AY(A):GOSUB27
       0:PRINT"{WHT}"AM$(A);
PD 220 IFA$=CHR$(13)THEN260
CH 230 IFA$="{DOWN}"THENA=A+1+
       (A>NA-1)*NA
HD 240 IFA$="{UP}"THENA=A-1-(A
       <NA-2)*NA
KF 250 GOTO190
KR 260 ONAGOTO470,400,690,880:
       GOTO80
GG 270 POKEXR,Y:POKEYR,W:SYS65
       520:RETURN
DF 280 POKEB,6:POKEBA,6
HR 290 PRINT"{CLR}{2 SPACES}
       {CYN}{RVS}{A3}**********
       **********************
       *{S3}"
RD 300 PRINT"{2 SPACES}{RVS}-
       {2 SPACES}{7}{A3}******
       **********************
       {S3}{CYN}{2 SPACES}-"
FP 310 FORI=1TO16:PRINT"
       {2 SPACES}{RVS}-
       {2 SPACES}{7}-
       {28 SPACES}-{CYN}
       {2 SPACES}-":NEXT
HF 320 PRINT"{2 SPACES}{RVS}-
       {2 SPACES}{7}{Z3}*******
       **********************
       {X3}{CYN}{2 SPACES}-"
DB 330 PRINT"{2 SPACES}{CYN}
       {RVS}{Z3}**************
       ********************{X3}"
JF 340 PRINT" {DOWN}{2 SPACES}
       {RVS}{WHT}CRSR{OFF}=CHO
       ICE{9 SPACES}{RVS}{WHT}
       RETURN{OFF}=EXECUTE"
XE 350 GOSUB900:PRINT"{HOME}
       {2 DOWN}":PRINTTAB(9)"
       {RVS}{WHT}{A3}**********
       **********{S3}"
JE 360 PRINTTAB(9)"{RVS}-DYNAM
       IC SCREEN: MENU-"
EE 370 PRINTTAB(9)"{RVS}{Z3}***
       ****************{X3}"
HS 380 RETURN
XJ 390 REM READ FILE
GX 400 GOSUB970
PR 410 OPEN15,8,15:OPEN2,8,2,"
       0:£"+F$+",S,R":GOSUB65
       0:GOSUB940:IFDETHEN870
MQ 420 GET#2,A$:IFST=0THENPRIN
       TA$+CHR$(0);:GOTO420
EK 430 PRINT"{HOME}":POKECY,22
       :PRINT:POKEX,15:PRINT"
       {BLK}PRESS {RVS}RETURN
       {OFF}TO{HOME}"
MB 440 GETA$:IFA$=""ORA$<>CHR$
       (13)THEN440
JE 450 GOTO870
JC 460 REM WRITE SCREEN FILE
XJ 470 OPEN15,8,15:GOSUB970:PR
       INT"{CLR}"
PR 480 PRINT#15,"S0:£"+F$:GOS
       UB940:OPEN2,8,2,"0:£"+
       F$+",S,W"
FG 490 PRINT"{CLR}{BLK}{RVS} C
       OMPLETE YOUR SCREEN AND
        PRESS RETURN{2 SPACES}
       {OFF}"
EK 500 FORT=1TO2000:NEXT:GOSUB
       650
CB 510 GETA$:GOSUB570
PK 520 IFA$=""THEN510
HX 530 IFA$=CHR$(20)ORA$=CHR$(
       148)THEN510
XF 540 IFA$=CHR$(13)THENPRINT#
       2:GOTO870
BR 550 PRINTA$;:PRINT#2,A$;:GO
       TO510
HH 560 REM GET CURSOR
ME 570 WL=PEEK(X)
XS 580 IFWL>39THENWL=WL-40:GOT
       O580
BK 590 WL=WL+PEEK(CY)*40+SC
HG 600 POKECO+WL,PEEK(CC):WO=P
       EEK(WL):WT=WO:WQ=128:IF
       WO>127THENWQ=-WQ
SJ 610 WT=WT+WQ:POKEWL,WT:WQ=-
       WQ:FORWR=1TO40
RM 620 GETA$:IFA$<>""THENPOKEW
       L,WO:WR=40:NEXTWR:RETUR
       N
FA 630 NEXTWR:GOTO610
EM 640 REM BORDER
XJ 650 A=40:C=23:PRINT"{BLK}
       {CLR}{RVS}{A3}";:FORH=1T
       OA-2:PRINT"*";:NEXT
PG 660 PRINT"{S3}";:FORV=1TOC:P
       RINT"-"SPC(A-2)"-";:NEX
       T
AM 670 FORI=1TO40:POKESC+CO+96
       0+I,0:NEXT:POKESC+960,2
       37:FORI=0TO37
XX 680 POKESC+961+I,192:NEXT:P
       OKESC+999,253:PRINT"
       {2 HOME}":POKEX,4:RETUR
       N
XG 690 PRINT"{CLR}{BLK}{RVS}
       {6 SPACES}BLOCKS
       {2 SPACES}PROGRAMS
       {4 SPACES}FILE TYPE
       {5 SPACES}{OFF}"
JR 700 POKEB,2:POKEBA,15-(P=1)
       *34:OPEN15,8,15:OPEN2,8
       ,0,"$0":GOSUB940
CX 710 GET#2,A$,B$
GC 720 GET#2,A$,B$:GET#2,A$,B$
EB 730 A=0:IFA$<>""THENA=ASC(A
       $)
CH 740 IFB$<>""THENA=A+ASC(B$)
       *256
DD 750 PRINT"{9 RIGHT}{RVS}"MI
       D$(STR$(A),2);TAB(12);"
       {OFF}";
RK 760 GET#2,B$:IFST<>0THEN850
RP 770 IFB$<>CHR$(34)THEN760
QF 780 GET#2,B$:IFB$<>CHR$(34)
       THENPRINTB$;:GOTO780
KC 790 GET#2,B$:IFB$=CHR$(32)T
       HEN790
JC 800 PRINTTAB(28);:A$=""
QC 810 A$=A$+B$:GET#2,B$:IFB$<
       >""THEN810
SQ 820 PRINT"{RVS}"LEFT$(A$,3)
       :IFLEFT$(A$,3)="SEQ"THE
       NPRINTTAB(34)"{UP}{RED}
       <={BLK}"
EF 830 GETA$:IFA$<>""THEN870
HH 840 IFST=0THEN720
FP 850 PRINT" BLOCKS FREE":PRI
       NT"{14 RIGHT}PRESS
       {RVS}RETURN{OFF}"
EE 860 GETA$:IFA$<>CHR$(13)THE
       N860
EM 870 CLOSE2:CLOSE15:GOTO110
RX 880 PRINT"{CLR}":END
EE 890 REM TONE
CX 900 IFPEEK(65530)=164THENVO
       L7:SOUND1,881,9:RETURN
GE 910 POKE54296,15:POKE54276,
       33:POKE54277,9:POKE5427
       8,0
MB 920 POKE54273,34:POKE54286,
       75:FORT=1TO400:NEXT:POK
       E54276,2
MB 930 RETURN
XX 940 INPUT#15,A$,B$,C$,D$
JM 950 DE=0:IFVAL(A$)>0THENPRI
       NTA$,B$,C$,D$:FORT=1TO2
       000:NEXT:DE=1
SD 960 RETURN
CA 970 INPUT"{HOME}{23 DOWN}
       {3 RIGHT}FILENAME";F$:I
       FLEN(F$)>15THEN970
DB 980 IFF$=""THENCLOSE15:GOTO
       110
BF 990 PRINT"{CLR}{BLK}":POKEB
       ,1:POKEBA,15-(P=1)*34:R
       ETURN
```

Program 2: Dynamic Screen Reader

```
KC 10 REM COPYRIGHT 1987 COMPU
      TE! PUBLICATIONS, INC. -
       ALL RIGHTS RESERVED
GD 20 B=53280:BA=B+1:X=211:CY=
      214:SC=1024:CO=54272
JE 30 IFPEEK(65530)=5THENBANK1
      5:X=236:CY=235
SE 40 IFPEEK(65530)<>164THEN60
QH 50 B=65305:BA=B-4:X=202:CY=
```

```
      X+3:SC=3072:CO=-1024:P=1
PP 60 PRINTCHR$(8)CHR$(14)"
      {CLR}{3 SPACES}COPYRIGHT
       1987 COMPUTE! PUB., INC
      ."
DQ 70 PRINTTAB(10)"ALL RIGHTS
      {SPACE}RESERVED":FORI=1T
      O2000:NEXT
BG 80 PRINT"{CLR}{BLK}":POKEB,
      1:POKEBA,15-(P=1)*34:F$=
      "DEMO":REM SCREEN FILENA
      ME
EG 90 OPEN15,8,15:OPEN2,8,2,"0
      :£"+F$+",S,R":GOSUB160:
      GOSUB200
QF 100 IFDETHEN140
QR 110 GET#2,A$:IFST=0THENPRIN
      TA$+CHR$(0);:GOTO110
HF 120 PRINT"{HOME}":POKECY,22
      :PRINT:POKEX,15:PRINT"
      {BLK}PRESS {RVS}RETURN
      {OFF}TO {HOME}"
AF 130 GETA$:IFA$=""ORA$<>CHR$
      (13)THEN130
JQ 140 CLOSE2:CLOSE15:PRINT"
      {CLR}":END
KR 150 REM BORDER
SK 160 A=40:C=23:PRINT"{BLK}
      {CLR}{RVS}£A£";:FORH=1T
      OA-2:PRINT"*";:NEXT
EA 170 PRINT"£S£";:FORV=1TOC:P
      RINT"-"SPC(A-2)"-";:NEX
      T
PP 180 FORI=1TO40:POKESC+CO+96
      0+I,0:NEXT:POKESC+960,2
      37:FORI=0TO37
RA 190 POKESC+961+I,192:NEXT:P
      OKESC+999,253:PRINT"
      {2 HOME}":POKEX,4:RETUR
      N
KS 200 INPUT#15,A$,B$,C$,D$
JP 210 DE=0:IFVAL(A$)>0THENPRI
      NTA$,B$,C$,D$:FORT=1TO2
      000:NEXT:DE=1
CD 220 RETURN
```

BEFORE TYPING . . .

Before typing in programs, please refer to "How To Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

Disk Rapid Transit

See instructions in article on page 91 before typing in.

```
0801:0B 08 0A 00 9E 32 30 36 2E
0809:33 00 00 00 00 00 A9 0F 15
0811:A8 A2 08 20 BA FF A2 9F DB
0819:A0 14 A9 05 20 BD FF 20 1C
0821:EE 11 A9 0F 20 C3 FF A9 CC
0829:08 8D D6 12 A5 01 29 FE 1F
0831:85 01 A2 FE 9A A2 03 A9 97
0839:00 95 00 E8 E0 2B D0 F9 8C
0841:20 E7 FF A2 00 BD 1D 13 C9
0849:20 D2 FF E8 E0 EF D0 F5 0B
0851:AE D6 12 A9 00 20 8E 12 FA
0859:20 E4 FF C9 58 D0 07 A9 0D
0861:07 85 01 6C 02 A0 C9 24 87
0869:D0 03 4C 7D 0F C9 52 D0 19
0871:03 4C EE 0D C9 54 D0 0B 11
0879:AD D6 12 49 01 8D D6 12 EA
0881:4C 2D 08 C9 0D F0 A5 C9 E1
0889:31 90 CD C9 33 B0 C9 38 D4
0891:E9 31 AA BD DA 12 8D D6 25
0899:12 BD D8 12 8D D7 12 20 6E
08A1:96 0B 20 8B 11 20 CB 0D 2A
08A9:20 E4 FF C9 0D D0 F9 A9 E8
08B1:0F A2 08 A8 20 BA FF A9 13
08B9:00 20 BD FF 20 EE 11 20 88
08C1:D8 11 20 0B 12 90 0B 20 40
08C9:CC FF A9 0F 20 C3 FF 4C C2
08D1:2D 08 20 CC FF A9 12 8D A3
08D9:8B 12 A9 00 8D 8C 12 20 4C
08E1:6A 12 20 E4 FF 85 61 20 F6
08E9:E4 FF 85 62 20 CC FF A9 21
08F1:0F 20 C3 FF A9 12 8D 7F 3A
08F9:19 A9 00 8D 80 19 A9 00 95
0901:85 07 A9 1A 85 08 AD D7 ED
0909:12 8D D5 12 20 6D 16 A5 EB
0911:08 85 25 A9 00 85 0D A9 A1
0919:00 85 03 A9 1B 85 04 A0 1F
0921:02 B1 03 F0 1D C9 84 F0 1A
0929:19 A0 1F B1 03 D0 13 A0 11
0931:1E A9 BE 38 E5 08 D1 03 0E
0939:90 08 E6 0D A0 01 A9 FF 9F
0941:91 03 A9 20 18 65 03 85 F5
0949:03 D0 D4 A0 00 B1 03 F0 73
0951:05 E6 04 4C 20 09 A5 0D 62
0959:D0 03 4C 2D 08 A9 00 85 5D
0961:22 85 1D A9 93 20 D2 FF E6
0969:A5 22 0A 0A 0A 0A 20 26 97
0971:0B A5 0D 4A 4A 4A 4A 85 4E
0979:20 A5 0D 29 0F 85 21 A9 B3
0981:00 85 1F A9 13 20 D2 FF 32
0989:A0 01 B1 03 30 10 18 A5 2A
0991:03 69 20 85 03 A5 04 69 FB
0999:00 85 04 4C 8B 09 20 4A 5D
09A1:0B A0 01 E6 1F A5 20 C5 85
09A9:22 F0 09 A5 1F C9 10 F0 B5
09B1:09 4C 8F 09 A5 1F C5 21 34
09B9:90 D4 A2 10 A0 00 18 20 F3
09C1:F0 FF A2 00 BD 18 15 20 39
09C9:D2 FF E8 E0 CD D0 F5 A9 B7
09D1:20 20 D2 FF A6 1D A0 00 41
09D9:18 20 F0 FF A9 3E 20 D2 77
09E1:FF A9 00 85 D3 20 E4 FF 9F
09E9:C9 00 F0 F9 A2 00 DD 07 76
09F1:0A F0 07 E8 E0 09 D0 F6 78
09F9:F0 D5 8A 0A AA BD 11 0A 64
0A01:48 BD 10 0A 48 60 20 91 E0
0A09:11 2B 43 2D 4D 41 85 3A 60
0A11:0A 21 0A 2B 0A 06 0B 80 65
0A19:0A 15 0B 79 0A 2C 08 51 D2
0A21:0A C6 1D 10 AA A9 00 85 12
0A29:1D F0 A4 A6 1D E6 1D A5 6B
0A31:1D C5 1F D0 9A 86 1D 4C AB
0A39:D0 09 A5 22 0A 0A 0A 0A 65
0A41:18 65 1D 20 26 0B A0 01 FF
0A49:B1 03 49 01 91 03 4C 69 CA
0A51:09 A9 00 85 03 A9 1B 85 27
0A59:04 A0 01 B1 03 10 04 49 7C
0A61:01 91 03 18 A5 03 69 20 68
0A69:85 03 90 EF 88 B1 03 F0 14
0A71:05 C8 E6 04 D0 E5 4C 69 77
0A79:09 A9 FF 85 26 4C 85 0A 4C
0A81:A9 00 85 26 A9 00 85 23 F8
0A89:A9 1B 85 24 A0 01 B1 23 BB
0A91:C9 FE F0 14 18 A5 23 69 B0
0A99:20 85 23 D0 EF A0 00 B1 44
0AA1:23 F0 60 E6 24 4C 8D 0A 75
0AA9:A5 23 85 03 A5 24 85 04 07
0AB1:A5 25 85 08 A9 00 85 07 72
0AB9:20 CB 0D 20 96 0B AD D6 87
0AC1:12 CD D7 12 D0 0A 20 8B E8
0AC9:11 20 E4 FF C9 0D D0 F9 29
0AD1:20 BA 0B 24 26 10 BD A2 D7
0AD9:00 BD 17 0F 20 D2 FF E8 66
0AE1:E0 66 D0 F5 A5 23 85 03 41
0AE9:A5 24 85 04 20 4A 0B 20 2B
0AF1:8B 11 20 E4 FF C9 4E F0 17
0AF9:9B C9 57 D0 F5 20 37 0C F0
0B01:4C D8 0A 4C 64 09 A5 22 2E
0B09:C5 20 F0 16 E6 22 A9 00 9C
0B11:85 1D 4C 64 09 A5 22 F0 15
0B19:09 C6 22 A9 00 85 1D 4C E0
0B21:64 09 4C D0 09 AA E8 A9 B0
0B29:00 85 03 A9 1B 85 04 A0 33
0B31:01 B1 03 10 04 CA D0 01 83
0B39:60 18 A5 03 69 20 85 03 44
0B41:A5 04 69 00 85 04 4C 32 5F
0B49:0B A9 20 20 D2 FF A0 01 2E
0B51:B1 03 C9 FE D0 05 A9 12 2A
0B59:20 D2 FF A0 05 B1 03 C9 FC
0B61:A0 F0 0B 20 D2 FF C0 15 94
0B69:F0 04 C8 4C 5E 0B A2 14 4F
0B71:A9 20 20 D2 FF E4 D3 D0 A1
0B79:F9 A0 1E B1 03 AA C8 B1 99
0B81:03 20 8E 12 A2 19 A9 20 01
0B89:20 D2 FF E4 D3 D0 F9 A9 32
0B91:0D 20 D2 FF 60 AD D6 12 0A
0B99:CD D7 12 F0 10 A2 00 BD A6
0BA1:0C 14 20 D2 FF E8 E0 93 EC
0BA9:D0 F5 60 A2 00 BD 0C 14 FE
0BB1:20 D2 FF E8 E0 69 D0 F5 5F
0BB9:60 AD D7 12 8D D5 12 A5 15
0BC1:03 85 19 A5 04 85 1A A0 43
0BC9:03 B1 03 8D 7F 19 C8 B1 AA
0BD1:03 8D 80 19 A5 08 85 16 DC
0BD9:A9 0F A2 08 A8 20 BA FF 98
0BE1:A9 00 20 BD FF 20 EE 11 1C
0BE9:20 D8 11 20 0B 12 90 0B 37
0BF1:20 47 12 20 28 12 68 68 F0
0BF9:4C B9 0A 20 6A 12 20 E4 A8
0C01:FF 85 63 20 E4 FF 85 64 7F
0C09:20 CC FF A9 0F 20 C3 FF 7F
0C11:A5 63 C5 61 D0 06 A5 64 F1
0C19:C5 62 F0 13 A2 00 BD E5 72
0C21:15 20 D2 FF E8 E0 16 D0 ED
0C29:F5 20 28 12 4C D9 0B 20 6A
0C31:6D 16 A5 08 85 15 A5 15 9B
0C39:85 08 AD D6 12 8D D5 12 BD
0C41:24 26 30 05 CD D7 12 D0 0E
0C49:2C A2 00 BD DC 12 20 D2 3E
0C51:FF E8 E0 41 D0 F5 20 CD 40
0C59:11 A5 19 85 03 A5 1A 85 47
0C61:04 20 4A 0B 20 8B 11 20 EE
0C69:E4 FF C9 41 D0 03 4C 2D 99
0C71:08 C9 0D D0 F2 20 ED 0F B1
0C79:D0 13 A2 00 BD 00 0F 20 3F
0C81:D2 FF E8 E0 17 D0 F5 20 36
0C89:28 12 4C 76 0C A9 12 8D E3
0C91:7F 19 A9 00 8D 80 19 A5 2B
0C99:08 85 17 20 6D 16 A4 17 20
0CA1:C8 84 04 A9 00 85 03 A0 17
0CA9:02 B1 19 D1 03 D0 0F A0 89
0CB1:05 B1 19 D1 03 D0 07 C8 2B
0CB9:C0 15 F0 16 D0 F3 18 A9 27
0CC1:20 65 03 85 03 D0 E0 A0 B9
0CC9:00 B1 03 F0 18 E6 04 4C 6E
0CD1:A8 0C A2 00 BD 08 16 20 EF
0CD9:D2 FF E8 E0 13 D0 F5 20 6E
0CE1:28 12 4C 76 0C A4 17 C8 6D
0CE9:84 04 A9 00 85 03 A0 02 F5
0CF1:B1 03 F0 56 98 18 69 20 3F
0CF9:A8 90 F5 A0 00 B1 03 F0 11
0D01:05 E6 04 4C EF 0C E6 04 1E
0D09:A9 00 A8 91 03 C8 D0 FB FE
0D11:C8 A9 FF 91 03 A5 04 85 4F
0D19:18 A5 17 85 04 A9 00 85 30
0D21:03 A2 01 A0 00 A9 12 91 EB
0D29:03 85 11 C8 BD 52 16 91 C9
0D31:03 85 12 E6 04 E8 A5 04 F1
0D39:C5 18 D0 E7 20 9F 10 A5 1A
0D41:18 85 04 A9 00 85 03 4C 4C
0D49:EF 0C 88 88 98 18 65 03 EA
0D51:85 03 85 1B A9 00 65 04 6D
0D59:85 04 85 1C A5 19 85 05 4B
0D61:A5 1A 85 06 A0 02 B1 05 5B
0D69:91 03 C8 C0 20 D0 F7 A5 0C
0D71:17 85 08 20 27 10 A5 12 52
0D79:85 0F A5 11 85 10 A9 00 9F
0D81:85 05 A5 16 85 06 A0 00 3B
0D89:B1 05 F0 12 20 E8 10 A0 62
0D91:00 A5 11 91 05 C8 A5 12 F8
0D99:91 05 E6 06 D0 E8 A5 1C 8C
0DA1:85 06 A5 1B 85 05 A0 03 EA
0DA9:A5 10 91 05 C8 A5 0F 91 A9
0DB1:05 20 65 16 A5 16 85 08 FC
0DB9:A9 00 85 07 A5 10 8D 7F D1
0DC1:19 A5 0F 8D 80 19 20 65 9A
0DC9:16 60 A9 0F A8 A2 08 20 2D
0DD1:BA FF A9 00 20 BD FF 20 96
0DD9:EE 11 A2 0F 20 C9 FF A9 C6
0DE1:5E 20 D2 FF 20 CC FF A9 6B
0DE9:0F 20 C3 FF 60 A2 00 BD 57
```

```
0DF1:4B 0E 20 D2 FF E8 E0 6E 3A
0DF9:D0 F5 20 E4 FF C9 0D D0 5E
0E01:F9 A9 0F A8 A2 08 20 BA 21
0E09:FF A9 00 20 BD FF 20 EE AE
0E11:11 A2 0F 20 C9 FF A2 00 D5
0E19:BD 43 0E 20 D2 FF E8 E0 F1
0E21:08 D0 F5 20 CC FF A9 0F FE
0E29:20 C3 FF A2 00 BD B9 0E E8
0E31:20 D2 FF E8 E0 47 D0 F5 5C
0E39:20 E4 FF C9 0D D0 F9 4C 27
0E41:2D 08 4D 2D 57 77 00 02 0D
0E49:29 49 93 0D 0D 20 20 20 D8
0E51:20 20 20 54 55 52 4E 20 7F
0E59:4F 46 46 20 41 4C 4C 20 6D
0E61:44 52 49 56 45 53 20 45 BF
0E69:58 43 45 50 54 20 54 48 44
0E71:45 0D 20 20 20 20 20 44 7F
0E79:52 49 56 45 20 54 4F 20 41
0E81:42 45 20 43 48 41 4E 47 73
0E89:45 44 20 46 52 4F 4D 20 4C
0E91:38 20 54 4F 20 39 2E 0D A0
0E99:0D 20 20 20 20 20 20 20 2C
0EA1:20 20 20 20 20 20 52 45 47
0EA9:54 55 52 4E 20 57 48 45 A8
0EB1:4E 20 52 45 41 44 59 0D 76
0EB9:93 0D 0D 20 20 20 20 20 68
0EC1:20 20 54 55 52 4E 20 4F 31
0EC9:4E 20 54 48 45 20 4F 54 C1
0ED1:48 45 52 20 44 52 49 56 04
0ED9:45 20 4E 4F 57 0D 20 20 AE
0EE1:20 20 20 20 20 20 20 50 2E
0EE9:55 53 48 20 52 45 54 55 36
0EF1:52 4E 20 57 48 45 4E 20 58
0EF9:52 45 41 44 59 2E 0D 0D A7
0F01:57 52 49 54 45 20 50 52 6B
0F09:4F 54 45 43 54 20 45 52 C0
0F11:52 4F 52 0D 0D 0D 93 0D 18
0F19:0D 20 20 20 20 4D 55 4C F8
0F21:54 49 20 43 4F 50 59 20 82
0F29:2D 20 0D 0D 20 20 20 20 3A
0F31:57 20 2D 20 57 52 49 54 95
0F39:45 20 46 49 4C 45 20 41 58
0F41:47 41 49 4E 2E 0D 20 20 67
0F49:20 20 4E 20 2D 20 41 44 FB
0F51:56 41 4E 43 45 20 54 4F 8B
0F59:20 4E 45 58 54 20 46 49 42
0F61:4C 45 2E 0D 0D 20 20 20 D6
0F69:20 43 55 52 52 45 4E 54 D0
0F71:20 46 49 4C 45 20 4E 41 A7
0F79:4D 45 0D 0D A9 01 A2 EC 85
0F81:A0 0F 20 BD FF A9 08 AE F8
0F89:D6 12 A0 00 20 BA FF 20 B7
0F91:EE 11 A5 90 D0 45 A2 08 12
0F99:20 C6 FF 20 E4 FF 20 E4 C7
0FA1:FF A9 0D 20 D2 FF 20 E4 89
0FA9:FF A5 90 D0 2E 20 E4 FF 0C
0FB1:20 E4 FF 8D 23 10 20 E4 70
0FB9:FF AE 23 10 A4 90 D0 1B 0D
0FC1:20 8E 12 A9 20 20 D2 FF 97
0FC9:20 E4 FF C9 00 F0 D2 20 57
0FD1:D2 FF 20 E1 FF F0 04 A5 EC
0FD9:90 F0 ED A9 0D 20 D2 FF 63
0FE1:20 CC FF A9 08 20 C3 FF 26
0FE9:4C 59 08 24 A9 08 AE D6 69
0FF1:12 A0 0F 20 BA FF A9 06 54
0FF9:A2 1C A0 10 20 BD FF 20 9D
1001:EE 11 A2 08 20 C6 FF 20 ED
1009:E4 FF 8D 22 10 20 CC FF 0A
1011:A9 08 20 C3 FF AD 22 10 53
1019:29 10 60 4D 2D 52 00 1C 81
1021:01 00 00 4C 6B 11 A9 01 7A
1029:85 13 A9 12 38 E5 13 85 2C
1031:11 90 09 F0 07 20 DB 10 AE
1039:B1 03 D0 14 A9 12 18 65 79
1041:13 85 11 E6 13 C9 24 B0 95
1049:DA 20 DB 10 B1 03 F0 DA B1
1051:A9 00 85 12 20 5D 10 F0 9F
1059:CA 4C 9F 10 20 DB 10 A6 1E
1061:11 BD 7B 10 85 14 A5 12 C3
1069:C5 14 B0 09 20 C1 10 D0 11
1071:08 E6 12 D0 F1 A9 00 85 5A
1079:12 60 00 15 15 15 15 15 48
1081:15 15 15 15 15 15 15 15 A1
1089:15 15 15 15 13 13 13 13 8B
1091:13 13 13 12 12 12 12 12 92
1099:12 11 11 11 11 11 20 DB 23
10A1:10 A5 12 4A 4A 4A A8 C8 AF
10A9:A5 12 29 07 AA BD D3 10 BA
10B1:49 FF 31 03 91 03 A0 00 A6
10B9:B1 03 AA CA 8A 91 03 60 76
10C1:A5 12 4A 4A 4A A8 C8 A5 53
10C9:12 29 07 AA BD D3 10 31 57
10D1:03 60 01 02 04 08 10 20 4C
10D9:40 80 A5 11 0A 0A 85 03 86
10E1:A5 17 85 04 A0 00 60 20 71
10E9:DB 10 B1 03 F0 2D A5 12 FB
10F1:18 69 0A 85 12 A6 11 BD 1D
10F9:7B 10 85 14 A5 12 C5 14 E2
1101:B0 0D 20 5D 10 D0 97 20 AB
1109:5D 10 D0 92 4C 6B 11 A5 F8
1111:12 38 E5 14 85 12 E6 12 9C
1119:4C 03 11 A9 02 85 0E A5 C6
1121:11 C9 12 90 23 E6 11 A5 06
1129:11 C9 24 F0 13 20 DB 10 BA
1131:B1 03 F0 F1 A9 00 85 12 94
1139:20 5D 10 F0 E8 4C 9F 10 9B
1141:C6 0E F0 26 A9 12 85 11 7C
1149:C6 11 F0 13 20 DB 10 B1 A4
1151:03 F0 F5 A9 00 85 12 20 E4
1159:5D 10 F0 EC 4C 9F 10 C6 E2
1161:0E F0 07 A9 12 85 11 4C 57
1169:26 11 68 68 A2 00 BD A4 AB
1171:14 20 D2 FF E8 E0 74 D0 84
1179:F5 20 E4 FF C9 00 F0 F9 65
1181:C9 0D D0 03 4C 76 0C 4C B6
1189:2D 08 A9 0F 8D 18 D4 A9 8A
1191:C3 8D 0E D4 A9 19 8D 0F E3
1199:D4 A9 3C 8D 00 D4 A9 73 0B
11A1:8D 01 D4 A9 0C 8D 05 D4 75
11A9:A9 C9 8D 06 D4 A9 15 8D 2A
11B1:04 D4 A9 60 AA A8 CA D0 A4
11B9:FD 88 D0 FA A9 14 8D 04 83
11C1:D4 A9 67 AA A8 CA D0 FD 60
11C9:88 D0 FA 60 A2 1D A9 00 A6
11D1:9D 00 D4 CA 10 FA 60 A2 D9
11D9:0F 20 C9 FF A2 00 BD 85 DA
11E1:12 20 D2 FF E8 E0 03 D0 11
11E9:F5 20 CC FF 60 20 C0 FF AD
11F1:B0 01 60 A2 00 BD 37 16 5E
11F9:20 D2 FF E8 E0 1B D0 F5 7A
1201:20 E4 FF C9 00 F0 F9 4C 0F
1209:2D 08 A2 0F 20 C6 FF 20 47
1211:E4 FF 85 65 20 E4 FF 85 C8
1219:66 C9 30 D0 08 A5 65 C9 61
1221:30 D0 02 18 60 38 60 A2 9A
1229:00 BD 1B 16 20 D2 FF E8 B6
1231:E0 1C D0 F5 20 8B 11 20 B7
1239:E4 FF C9 0D D0 01 60 C9 EE
1241:41 D0 F4 4C 2D 08 A2 00 6C
1249:BD FB 15 20 D2 FF E8 E0 39
1251:0D D0 F5 20 E4 FF 20 E4 3D
1259:FF 20 D2 FF C9 0D D0 F6 FA
1261:20 CC FF A9 0F 20 C3 FF E3
1269:60 A2 0F 20 C9 FF A2 00 DD
1271:BD 88 12 20 D2 FF E8 E0 24
1279:06 D0 F5 20 CC FF A2 0F 50
1281:20 C6 FF 60 49 30 3A 4D 3A
1289:2D 52 00 00 02 85 0A 86 99
1291:09 A2 09 86 0B A0 B0 A5 4E
1299:09 DD CA 12 A5 0A FD CB 51
12A1:12 90 0C 85 0A A5 09 FD C3
12A9:CA 12 85 09 C8 D0 E8 98 EC
12B1:CA F0 0E C9 B0 F0 02 85 A8
12B9:0B 24 0B 30 04 A5 0C F0 90
12C1:05 29 7F 20 D2 FF CA 10 E0
12C9:CC 60 01 00 0A 00 64 00 A5
12D1:E8 03 10 27 08 08 08 08 18
12D9:08 08 09 93 0D 0D 20 20 5B
12E1:20 20 20 20 20 20 49 4E 86
12E9:53 45 52 54 20 44 45 53 88
12F1:54 49 4E 41 54 49 4F 4E 25
12F9:20 44 49 53 4B 0D 20 20 8C
1301:20 20 20 20 20 20 20 20 27
1309:20 52 45 54 55 52 4E 20 72
1311:57 48 45 4E 20 52 45 41 98
1319:44 59 0D 0D 93 0D 0D 20 35
1321:20 20 20 20 20 20 20 20 47
1329:44 49 53 4B 20 52 41 50 FF
1331:49 44 20 54 52 41 4E 53 DD
1339:49 54 20 0D 0D 20 20 20 37
1341:20 43 4F 50 59 52 49 47 25
1349:48 54 20 31 39 38 37 20 F8
1351:43 4F 4D 50 55 54 45 21 43
1359:20 50 55 42 2E 0D 0D 20 52
1361:20 20 20 20 20 20 20 20 87
1369:20 53 45 4C 45 43 54 20 E1
1371:43 4F 50 59 20 54 59 50 02
1379:45 0D 0D 0D 20 31 2E 20 3A
1381:2D 20 53 49 4E 47 4C 45 B2
1389:20 44 52 49 56 45 20 43 FA
1391:4F 50 59 2E 0D 20 32 2E FC
1399:20 2D 20 54 57 4F 20 44 E0
13A1:52 49 56 45 20 43 4F 50 5F
13A9:59 2E 0D 0D 0D 0D 20 58 AF
13B1:20 20 2D 20 45 58 49 54 0A
13B9:20 54 4F 20 42 41 53 49 F7
13C1:43 2E 0D 20 24 20 20 2D C7
13C9:20 44 49 52 45 43 54 4F 8E
13D1:52 59 2E 0D 20 52 20 20 B8
13D9:2D 20 43 48 41 4E 47 45 A2
13E1:20 44 52 49 56 45 20 4E 5E
13E9:55 4D 42 45 52 2E 0D 20 30
13F1:54 20 20 2D 20 54 4F 47 59
13F9:47 4C 45 20 43 55 52 52 E7
1401:45 4E 54 20 44 52 49 56 40
1409:45 2E 20 93 0D 0D 20 20 99
1411:20 20 20 20 49 4E 53 45 C6
1419:52 54 20 53 4F 55 52 43 70
1421:45 20 44 49 53 4B 20 49 62
1429:4E 20 44 52 49 56 45 20 7C
1431:38 0D 20 20 20 54 48 45 E6
1439:20 44 52 49 56 45 20 57 C0
1441:49 54 48 20 54 48 45 20 9C
1449:46 4C 41 53 48 49 4E 47 50
1451:20 4C 49 47 48 54 0D 0D F4
1459:20 20 20 20 20 20 20 20 81
1461:20 20 20 20 52 45 54 55 4D
1469:52 4E 20 54 4F 20 42 45 5C
1471:47 49 4E 0D 0D 0D 20 49 50
1479:4E 53 45 52 54 20 54 48 7F
1481:45 20 44 45 53 54 49 4E FD
1489:41 54 49 4F 4E 20 44 49 4A
1491:53 4B 20 49 4E 20 44 52 9C
1499:49 56 45 20 39 0D 55 30 7F
14A1:3E 4D 30 93 0D 0D 20 20 78
14A9:20 20 20 20 4E 4F 20 52 32
14B1:4F 4F 4D 20 4F 4E 20 44 39
14B9:49 53 4B 20 54 4F 20 53 3A
14C1:41 56 45 20 46 49 4C 45 FF
14C9:0D 20 20 20 50 55 53 48 4D
14D1:20 52 45 54 55 52 4E 20 3D
14D9:54 4F 20 54 52 59 20 4F D0
14E1:4E 20 44 49 46 46 45 52 7E
14E9:4E 54 20 44 49 53 4B 0D D1
14F1:20 20 20 50 55 53 48 20 E3
14F9:41 4E 59 20 4B 45 59 20 C5
1501:54 4F 20 52 45 54 55 52 CA
1509:4E 20 54 4F 20 4D 41 49 E3
1511:4E 20 4D 45 4E 55 0D 20 6A
1519:2D 2D 2D 2D 2D 2D 2D 2D 43
1521:2D 2D 2D 2D 2D 2D 2D 2D 4B
1529:2D 2D 2D 2D 2D 2D 2D 2D 53
1531:2D 2D 2D 2D 2D 2D 2D 2D 5B
1539:2D 2D 2D 2D 2D 0D 20 16
1541:53 50 41 43 45 20 20 54 C4
1549:4F 47 47 4C 45 20 53 45 31
1551:4C 45 43 54 49 4F 4E 0D D1
1559:20 43 55 52 53 4F 52 20 D0
1561:55 50 2F 44 4F 57 4E 20 09
1569:20 4D 4F 56 45 53 20 43 41
1571:55 52 53 4F 52 0D 20 41 82
1579:20 20 20 52 45 54 55 52 5D
1581:4E 20 54 4F 20 4D 41 49 5C
1589:4E 20 4D 45 4E 55 0D 20 E2
1591:43 20 20 20 43 4F 50 59 BC
1599:20 53 45 4C 45 43 54 4F 45
15A1:4E 53 0D 20 4D 20 20 20 B6
15A9:4D 41 4B 45 20 4D 55 4C B5
15B1:54 49 50 4C 45 20 43 4F A7
15B9:50 49 45 53 0D 20 2B 2F AA
15C1:2D 20 43 48 41 4E 47 45 8E
15C9:20 50 41 47 45 0D 20 46 99
15D1:31 20 20 54 4F 47 47 4C 58
15D9:45 20 41 4C 4C 20 46 49 54
```

```
15E1:4C 45 53 0D 0D 57 52 4F 78
15E9:4E 47 20 44 49 53 4B 20 A3
15F1:49 4E 20 44 52 49 56 45 46
15F9:2E 0D 0D 44 49 53 4B 20 B2
1601:45 52 52 4F 52 0D 3E 0D F3
1609:46 49 4C 45 20 45 58 49 98
1611:53 54 53 20 45 52 52 4F CF
1619:52 0D 0D 52 45 54 20 2D 61
1621:20 43 4F 4E 54 49 4E 55 B6
1629:45 0D 41 20 20 20 2D 20 61
1631:41 42 4F 52 54 0D 93 0D A8
1639:0D 44 45 56 49 43 45 20 0D
1641:4E 4F 54 20 50 52 45 53 9E
1649:45 4E 54 20 45 52 52 4F 9F
1651:52 00 01 04 07 0A 0D 10 91
1659:02 05 08 0B 0E 11 03 06 3A
1661:09 0C 0F 12 A9 57 8D EE CC
1669:17 4C 72 16 A9 52 8D EE 84
1671:17 A9 0F A8 AE D5 12 20 11
1679:BA FF A9 00 20 BD FF 20 50
1681:EE 11 20 D8 11 20 0B 12 2C
1689:90 09 20 47 12 20 28 12 2C
1691:4C 72 16 20 CC FF AD 11 18
1699:D0 8D 6B 17 AD 0E DC 8D 5D
16A1:70 17 A9 00 8D 11 D0 8D E0
16A9:0E DC A9 FA 85 03 A9 17 9B
16B1:85 04 A9 00 85 05 A9 04 6E
16B9:85 06 A2 0F 20 C9 FF 20 B7
16C1:EF 17 A9 57 20 D2 FF A5 48
16C9:05 20 D2 FF A5 06 20 D2 33
16D1:FF A9 1E 20 D2 FF A0 00 06
16D9:B1 03 20 D2 FF C8 C0 1E 93
16E1:D0 F6 20 CC FF 18 A5 03 B3
16E9:69 1E 85 03 A5 04 69 00 43
16F1:85 04 A5 05 18 69 1E 85 0F
16F9:05 A5 06 69 00 85 06 A5 31
1701:05 C9 88 A5 06 E9 05 90 02
1709:B1 A2 0F 20 C9 FF 20 EF 1B
1711:17 A9 45 20 D2 FF AD EE C0
1719:17 C9 57 F0 5D A9 85 20 FB
1721:D2 FF A9 04 20 D2 FF 78 F2
1729:20 CC FF 78 A9 07 8D 00 A6
1731:DD 2C 00 DD 30 FB A0 00 E9
1739:A2 04 2C 00 DD 10 FB 48 AE
1741:68 48 68 48 68 48 68 AD 2A
1749:00 DD 0A 26 FF 0A 26 FF 07
1751:EA EA EA EA CA D0 F0 A5 DC
1759:FF 91 07 C8 D0 DA B1 07 B5
1761:F0 05 E6 08 4C 32 17 E6 E6
1769:08 A9 00 8D 11 D0 A9 00 FD
1771:8D 0E DC 58 A9 0F 20 C3 98
1779:FF 60 A9 A4 20 D2 FF A9 35
1781:04 20 D2 FF 20 CC FF 78 C0
1789:A9 07 8D 00 DD A5 08 8D 23
1791:9F 17 2C 00 DD 30 FB A9 2C
1799:00 8D 9E 17 AD 00 1A 85 97
17A1:FF A2 04 2C 00 DD 10 FB 4F
17A9:A9 00 06 FF 2A 06 FF 2A 01
17B1:A8 B9 EA 17 8D 00 DD CA 64
17B9:D0 EE 48 68 48 68 EA A9 FE
17C1:07 8D 00 DD EE 9E 17 D0 A5
17C9:D3 A0 00 B1 07 F0 05 E6 12
17D1:08 4C 8E 17 E6 08 AD 6B 78
17D9:17 8D 11 D0 AD 70 17 8D 11
17E1:0E DC A9 0F 20 C3 FF 58 DC
17E9:60 07 17 27 37 00 A9 4D B9
17F1:20 D2 FF A9 2D 20 D2 FF 0F
17F9:60 AD 00 1C 49 08 8D 00 0B
1801:1C A9 03 85 31 A5 22 C5 8C
1809:08 D0 68 2C 83 04 10 03 90
1811:4C C8 04 20 0A F5 50 FE E3
1819:B8 AD 01 1C 91 30 C8 D0 A2
1821:F5 A0 BA 50 FE B8 AD 01 08
1829:1C 99 00 01 C8 D0 F4 20 71
1831:E0 F8 AD 01 03 85 09 AD C3
1839:00 03 85 08 AD 00 03 85 54
1841:21 A2 04 A9 00 8D 00 18 14
1849:A9 00 06 21 2A 06 21 2A F6
1851:A8 B9 7F 04 8D 00 18 CA DB
1859:D0 EE 48 68 48 68 48 68 1A
1861:A9 02 8D 00 18 EE 44 04 A1
1869:D0 D2 A5 08 D0 8B A9 01 F4
1871:4C 69 F9 A9 00 4C 69 F9 F9
1879:0A 02 08 00 00 00 A9 02 85
1881:8D 00 18 A9 00 8D 83 04 57
1889:AD 85 05 85 08 AD 86 05 F3
1891:85 09 A9 E0 85 01 A5 01 86
1899:30 FC F0 F6 60 A9 02 8D E9
18A1:00 18 A9 FF 8D 83 04 A9 39
18A9:00 8D 84 04 AD 85 05 85 21
18B1:08 AD 86 05 85 09 A9 E0 F6
18B9:85 01 A5 01 30 FC F0 F6 FF
18C1:60 2C 84 04 10 75 20 E9 7E
18C9:F5 85 3A 20 8F F7 20 10 4C
18D1:F5 A2 09 50 FE B8 CA D0 0D
18D9:FA A9 FF 8D 03 1C AD 0C BA
18E1:1C 29 1F 09 C0 8D 0C 1C 4F
18E9:A9 FF A2 05 8D 01 1C B8 F4
18F1:50 FE B8 CA D0 FA A0 BB 3D
18F9:B9 00 01 50 FE B8 8D 01 23
1901:1C C8 D0 F4 B1 30 50 FE CA
1909:B8 8D 01 1C C8 D0 F5 50 A2
1911:FE AD 0C 1C 09 E0 8D 0C 64
1919:1C A9 00 8D 03 1C A9 00 78
1921:8D 84 04 AD 86 05 85 09 F2
1929:AD 85 05 85 08 F0 07 C5 64
1931:22 F0 08 4C 7A 04 A9 01 AE
1939:4C 69 F9 A2 04 A9 00 8D A9
1941:00 18 48 68 48 68 EA EA AD
1949:48 68 48 68 AD 00 18 4A 31
1951:26 21 4A 4A 26 21 48 68 7B
1959:CA D0 F1 A9 02 8D 00 18 5C
1961:A5 21 8D 00 03 EE 6A 05 0E
1969:D0 D1 A9 FF 8D 84 04 AD E1
1971:00 03 8D 85 05 AD 01 03 52
1979:8D 86 05 4C 00 04 11 00 AB
1981:00 00 00 00 00 00 00 00 B3
```

BEFORE TYPING . . .

Before typing in programs, please refer to "How To Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

Animal Match

See instructions in article on page 48 before typing in.

```
C000:4C 2A C1 00 E8 E2 5A 00 F1
C008:23 5B 08 00 00 00 0E 05 14
C010:02 02 01 01 01 02 00 01 54
C018:0A 0A 00 00 80 0D 0D 4D C0
C020:52 16 1B C9 30 90 5A C9 92
C028:5B B0 56 C9 41 B0 07 C9 8F
C030:3A 90 03 4C 81 C0 A0 00 68
C038:8C 13 C0 8D 06 C0 C9 41 BD
C040:90 03 38 E9 07 38 E9 30 8D
C048:8D 08 C0 A8 BE AC C0 B9 19
C050:D0 C0 A8 18 20 F0 FF AD 73
C058:15 C0 8D 86 02 A0 00 AD EE
C060:16 C0 F0 0C B9 9B C0 20 D9
C068:D2 FF C8 C0 11 D0 F5 60 90
C070:B9 87 C0 20 D2 FF C8 C0 B3
C078:14 D0 F5 AD 06 C0 20 D2 18
C080:FF A0 01 8C 13 C0 60 D5 45
C088:C0 C9 11 9D 9D 9D DD 20 18
C090:DD 11 9D 9D 9D CA C0 CB 38
C098:91 9D 9D 20 20 20 11 9D 41
C0A0:9D 9D 20 20 20 11 9D 9D 7C
C0A8:9D 20 20 20 0D 0D 0D 0D CA
C0B0:0D 0D 0D 0D 0D 0D 13 16 47
C0B8:16 13 10 13 13 13 10 13 55
C0C0:13 13 16 16 10 10 10 10 A5
C0C8:13 10 10 16 10 16 10 16 4A
C0D0:1F 04 07 0A 0D 10 13 16 49
C0D8:19 1C 06 14 0E 0C 0B 0F B5
C0E0:12 15 1A 18 1B 1E 1A 17 12
C0E8:1D 20 05 0E 09 11 17 11 4E
C0F0:08 0B 14 08 A9 93 20 D2 EA
C0F8:FF 60 A9 30 8D 09 C0 AD 8A
C100:09 C0 20 23 C0 EE 09 C0 03
C108:AD 09 C0 C9 5B D0 F0 60 B9
C110:A0 18 A9 00 99 00 D4 88 1E
C118:D0 FA A9 0F 8D 18 D4 A9 09
C120:80 8D 0C D4 A9 F0 8D 0D 4F
C128:D4 60 20 F4 C0 20 10 C1 E9
C130:A9 8E 20 D2 FF A9 08 20 34
C138:D2 FF A9 00 8D 21 D0 A9 96
C140:0B 8D 20 D0 A0 00 A9 05 1B
C148:8D 08 D4 A9 21 8D 0B D4 F3
C150:18 A2 02 A0 0E 20 F0 FF A5
C158:A0 00 8C 16 C0 B9 94 C1 F6
C160:F0 07 20 D2 FF C8 4C 5D 68
C168:C1 20 E4 FF C9 31 D0 08 2E
C170:A9 01 8D 12 C0 4C E2 C3 9C
C178:C9 32 D0 08 A9 00 8D 12 82
C180:C0 4C E2 C3 C9 33 D0 06 D2
C188:20 10 C1 4C 86 E3 20 F5 17
C190:C1 4C 69 C1 9E 41 4E 49 31
C198:4D 41 4C 20 4D 41 54 43 F9
C1A0:48 11 11 0D 9A 20 20 50 65
C1A8:52 45 53 53 3A 0D 0D 96 FC
C1B0:20 20 20 20 31 20 46 4F 38
C1B8:52 20 4B 45 59 53 20 4F D2
C1C0:4E 4C 59 0D 0D 99 20 20 A9
C1C8:20 20 32 20 46 4F 52 20 E0
C1D0:4B 45 59 53 20 41 4E 44 92
C1D8:20 53 48 41 50 45 53 0D A9
C1E0:0D 97 20 20 20 20 33 20 DE
C1E8:54 4F 20 45 58 49 54 20 73
C1F0:47 41 4D 45 00 AC 10 C0 F9
C1F8:C0 08 D0 02 A0 00 B9 1A AB
C200:C2 8D 18 D4 B9 12 C2 8D C3
C208:15 C0 C8 8C 10 C0 20 FA E8
C210:C0 60 00 02 08 07 05 06 9A
C218:04 00 01 03 05 07 09 06 4C
C220:04 02 A9 11 8D 0B D4 18 C8
C228:AD 0A C0 69 08 8D 0A C0 01
C230:8D 07 D4 D0 17 EE 0B C0 31
C238:AD 0B C0 8D 08 D4 C9 64 D3
C240:D0 0A A9 10 8D 0B D4 A9 D2
C248:00 8D 18 C0 60 A9 81 8D 7A
C250:12 D4 A9 0A 8D 0F D4 60 9C
C258:A2 23 A9 00 9D E8 C6 CA 16
C260:10 FA 60 20 58 C2 A2 12 DF
C268:A9 80 8D 1C C0 AD 1B D4 1E
C270:C9 24 B0 F9 A8 B9 E8 C6 5E
C278:D0 F3 8A 99 E8 C6 AD 1C 28
C280:C0 F0 08 A9 00 8D 1C C0 6D
C288:4C 6D C2 A9 80 8D 1C C0 B5
C290:CA D0 DA 60 A9 0D 8D F8 A6
C298:07 A9 0E 8D F9 07 A9 0F F4
C2A0:8D FA 07 AD 14 C0 20 7C C7
C2A8:C3 AC 14 C0 B9 1D C0 20 AD
C2B0:7A CB 20 3F C5 AC 14 C0 28
C2B8:B9 21 C0 A8 B9 D0 C0 8D 26
C2C0:04 C0 B9 AC C0 8D 05 C0 81
C2C8:20 47 C3 AD 14 C0 0A A8 E3
C2D0:AD 04 C0 99 00 D0 C8 AD 62
C2D8:05 C0 99 00 D0 AD 03 C0 48
C2E0:F0 0B AC 14 C0 C8 98 0D DF
C2E8:10 D0 8D 10 D0 AE 14 C0 87
C2F0:E8 8A 0D 15 D0 8D 15 D0 38
C2F8:AC 14 C0 B9 1D C0 A8 88 53
C300:B9 22 C6 8D 0E C0 AC 14 7F
C308:C0 99 27 D0 60 18 A2 05 F5
C310:A0 03 20 F0 FF AD 0E C0 4F
C318:8D 86 02 AD 14 C0 D0 06 6E
C320:18 A2 08 20 F0 FF AC 14 54
C328:C0 B9 1D C0 A8 C0 01 F0 69
C330:07 18 69 09 88 4C 2D C3 92
C338:A8 A2 0A 88 B9 34 C6 20 D2
C340:D2 FF C8 CA D0 F6 60 AD C7
C348:05 C0 0A 0A 0A 8D 05 C0 B5
C350:18 AD 05 C0 69 32 8D 05 30
C358:C0 A0 03 A9 00 8D 03 C0 60
C360:18 2E 04 C0 2E 03 C0 88 93
C368:D0 F6 18 AD 04 C0 69 18 02
C370:8D 04 C0 AD 03 C0 69 00 A0
C378:8D 03 C0 60 A2 03 86 FC D0
C380:A2 40 86 FB AA E0 00 F0 C3
C388:0B CA 18 A5 FB 69 40 85 31
C390:FB 4C 85 C3 60 A9 06 8D 59
C398:86 02 18 A2 0B A0 00 20 0C
C3A0:F0 FF A0 28 A9 A4 20 D2 2A
```

```
C3A8:FF 88 D0 FA 18 A2 03 A0 0E
C3B0:12 20 F0 FF A0 00 B9 C2 A2
C3B8:C3 20 D2 FF C8 C0 06 D0 AA
C3C0:F5 60 1E 43 59 43 4C 45 09
C3C8:18 A2 05 A0 14 20 F0 FF B2
C3D0:AE 11 C0 E8 8E 11 C0 A9 7E
C3D8:0A 8D 86 02 A9 00 20 CD 15
C3E0:BD 60 A9 0D 8D F8 07 A9 6D
C3E8:0E 8D F9 07 A9 0F 8D FA 2A
C3F0:07 20 4D C2 20 63 C2 20 0E
C3F8:F4 C0 A9 FF 8D 11 C0 20 B2
C400:10 C1 20 C8 C3 20 95 C3 20
C408:A9 0E 8D 15 C0 20 FA C0 2A
C410:A9 05 8D 0F C0 A9 12 8D B0
C418:07 C0 A9 01 8D 14 C0 8D 66
C420:17 C0 A9 46 8D 05 D0 A9 CA
C428:00 8D 04 D0 8D 11 C0 A9 7E
C430:04 0D 10 D0 8D 10 D0 A9 06
C438:04 8D 1D D0 8D 17 D0 A9 EB
C440:64 8D 19 C0 A9 02 20 7C A0
C448:C3 AD 17 C0 20 7A CB 20 B0
C450:3F C5 AC 17 C0 88 B9 22 AF
C458:C6 8D 29 D0 A9 04 0D 15 67
C460:D0 8D 15 D0 AD 19 C0 8D 46
C468:1A C0 A9 05 8D 1B C0 18 27
C470:A0 1B A2 09 20 F0 FF AD 68
C478:29 D0 8D 86 02 AD 17 C0 9A
C480:A8 20 2D C3 20 E4 FF C9 A6
C488:85 D0 03 4C DC C4 F0 08 12
C490:AE 0C C0 D0 03 20 4B C5 8E
C498:AD 18 C0 F0 03 20 22 C2 C5
C4A0:AD 07 C0 F0 31 AD 0C C0 03
C4A8:F0 03 20 14 C6 20 0B C6 44
C4B0:AD 1A C0 D0 CF A9 FB 2D 07
C4B8:15 D0 8D 15 D0 AC 17 C0 2C
C4C0:C8 8C 17 C0 C0 13 F0 03 F7
C4C8:4C 44 C4 20 C8 C3 A0 01 BB
C4D0:8C 17 C0 4C 44 C4 20 FC B5
C4D8:C4 20 E4 C4 A9 00 8D 15 33
C4E0:D0 4C 2A C1 A9 00 8D 1B CA
C4E8:C0 A0 03 A9 FF 8D 1A C0 21
C4F0:20 0B C6 AD 1A C0 D0 F8 6F
C4F8:88 D0 F0 60 20 10 C1 A9 8D
C500:11 8D 0B D4 A0 00 B9 2B C9
C508:C5 8D 08 D4 C8 B9 2B C5 71
C510:8D 07 D4 A9 1E 8D 1A C0 75
C518:20 0B C6 AD 1A C0 D0 F8 98
C520:C8 C0 14 D0 E1 A5 10 8D 23
C528:0B D4 60 43 0F 32 3C 2A 92
C530:3E 21 87 2A 3E 32 3C 43 2D
C538:0F 54 7D 64 79 86 1E A0 19
C540:00 B1 FD 91 FB C8 C0 3F D4
C548:D0 F7 60 A2 01 8E 16 C0 9F
C550:20 23 C0 AD 13 C0 F0 03 28
C558:4C F9 C5 AD 14 C0 D0 0B 6C
C560:AD 20 C0 CD 06 C0 D0 03 97
C568:4C F9 C5 AC 08 C0 B9 E8 BB
C570:C6 D0 03 4C F9 C5 AC 14 0D
C578:C0 99 1D C0 AD 06 C0 99 1B
C580:1F C0 AD 08 C0 99 21 C0 71
C588:20 94 C2 20 0D C3 CE 14 CC
C590:C0 F0 66 A9 07 8D 0C C0 67
C598:A9 00 8D 0D C0 4C F9 C5 6C
C5A0:AD 1E C0 CD 1D C0 D0 0A 17
C5A8:AC 12 C0 D0 1C CD 17 C0 3B
C5B0:F0 17 20 FA C5 A9 00 8D 90
C5B8:16 C0 AD 20 C0 20 23 C0 C4
C5C0:AD 1F C0 20 23 C0 4C EF A9
C5C8:C5 20 FA C5 A9 00 AC 22 C3
C5D0:C0 99 E8 C6 AC 21 C0 99 B1
C5D8:E8 C6 CE 07 C0 38 AD 19 30
C5E0:C0 ED 0F C0 8D 19 C0 8D 16
C5E8:18 C0 A9 00 8D 0B C0 A9 A9
C5F0:80 8D 16 C0 A9 01 8D 14 6F
C5F8:C0 60 A9 04 2D 15 D0 8D 5F
C600:15 D0 A9 04 2D 10 D0 8D 9A
C608:10 D0 60 CE 1B C0 D0 03 4B
C610:CE 1A C0 60 CE 0D C0 D0 A6
C618:08 CE 0C C0 D0 03 4C A0 B6
C620:C5 60 0F 0A 03 08 01 0D 72
C628:0C 0B 07 0E 01 07 0E 04 84
C630:0F 09 05 02 20 20 20 53 5D
C638:4E 41 49 4C 20 20 42 55 86
C640:54 54 45 52 46 4C 59 20 11
C648:20 20 20 46 49 53 48 20 9E
C650:20 20 20 20 20 44 45 45 DD
C658:52 20 20 20 20 20 5A 45 98
C660:42 52 41 20 20 20 20 20 AF
C668:4C 49 5A 41 52 44 20 20 D1
C670:20 45 4C 45 50 48 41 4E B1
C678:54 20 20 53 51 55 49 52 36
C680:52 45 4C 20 47 4F 4C 44 68
C688:46 49 4E 43 48 20 20 20 AC
C690:20 43 52 41 42 20 20 20 50
C698:50 4F 4C 41 52 20 42 45 9C
C6A0:41 52 20 47 49 52 41 46 38
C6A8:46 45 20 20 20 42 4C 55 A8
C6B0:45 20 4A 41 59 20 20 53 25
C6B8:54 41 52 46 49 53 48 20 B7
C6C0:20 20 53 50 49 44 45 52 0E
C6C8:20 20 20 20 20 20 42 41 BB
C6D0:54 20 20 20 20 20 20 46 9E
C6D8:52 4F 47 20 20 20 20 4C 5C
C6E0:41 44 59 42 55 47 20 20 97
C6E8:00 00 00 00 00 00 00 00 76
C6F0:00 00 00 00 00 00 00 00 7E
C6F8:00 00 00 00 00 00 00 00 86
C700:00 00 00 00 00 00 00 00 8F
C708:00 00 00 00 00 00 00 00 97
C710:00 00 00 00 00 00 00 00 9F
C718:07 F0 00 1F FC 00 3F FE BE
C720:00 7F FF 00 7C 7F 18 FB 9D
C728:BF B0 F7 DE E6 F6 DD F8 78
C730:F9 DB F8 7F B7 F0 1F B7 42
C738:FC 00 07 80 00 00 00 00 2F
C740:00 00 00 00 00 00 00 00 CF
C748:00 00 00 00 00 00 03 00 DD
C750:C0 70 C3 0E FC 66 3F FF B5
C758:18 FF DF DB FB E7 7E E7 12
C760:77 BD EE 1F FF F8 0F 7E 6B
C768:F0 03 E7 C0 1F FF F8 3D 62
C770:DB BC 33 99 CC 1F 81 F8 FB
C778:0F 00 F0 06 00 60 0C 00 A7
C780:30 00 00 00 00 00 00 00 28
C788:00 00 00 00 00 00 00 00 18
C790:00 00 00 00 00 00 00 00 20
C798:00 00 38 00 00 3E 00 C0 E8
C7A0:57 E0 F3 FF FC FF D5 B7 DD
C7A8:7A FF 7F FF FF B8 F1 FF 2C
C7B0:FE C0 E0 C0 00 01 80 00 1D
C7B8:00 00 00 00 00 00 00 00 48
C7C0:00 00 00 00 00 00 00 00 50
C7C8:00 CA 60 00 51 40 00 31 D3
C7D0:80 00 1B 00 00 6E C0 00 3F
C7D8:1F 00 00 15 80 00 1F 80 0C
C7E0:00 0E C0 00 01 FF E0 03 D8
C7E8:FF FC 03 FF FE 01 FF FB 10
C7F0:00 F8 78 01 60 1C 01 40 93
C7F8:6C 02 40 C8 06 40 18 00 35
C800:C0 00 00 00 00 00 00 00 F1
C808:00 00 00 00 00 00 00 00 99
C810:00 00 00 00 00 00 08 00 B1
C818:00 10 00 00 38 00 00 7C EB
C820:00 01 B6 0E DB 7F 6D B6 18
C828:E7 DB 6D C0 DB 6D 40 F6 6A
C830:FB 80 AC 06 80 32 01 80 25
C838:33 04 C0 31 86 C0 18 00 F6
C840:60 00 00 00 00 00 00 00 02
C848:00 00 00 00 00 00 00 00 D9
C850:00 00 00 00 00 00 0F 00 FF
C858:00 3F C0 00 7B E0 00 7F B0
C860:F8 00 06 FE 00 01 FF 00 23
C868:19 FF 80 39 BF C0 07 9F D8
C870:E0 00 3F F0 00 18 F8 30 EB
C878:CC 38 18 3C 1C 07 00 78 BA
C880:00 FF E0 00 00 00 00 00 2E
C888:00 00 00 00 00 00 00 00 1A
C890:00 00 00 01 CE 00 07 FF B6
C898:1F F7 FF 3F F7 B7 7F F7 41
C8A0:FF FF F7 FF BF FB 7B BF D5
C8A8:FC 9C 9F 87 E6 0F 03 C3 89
C8B0:1E C5 C3 1E CE EE 0F 66 D3
C8B8:E0 0F 00 70 00 00 00 00 85
C8C0:00 00 00 00 00 00 00 00 52
C8C8:00 00 00 00 00 00 00 00 5A
C8D0:00 00 01 B0 00 01 F0 3E B1
C8D8:01 50 7F 05 F0 7F 1E E0 E1
C8E0:E7 BF 00 E3 FF 80 C3 FB 1A
C8E8:E0 E1 FC 60 71 FF 00 30 C4
C8F0:FF 00 00 7E 00 00 3F 80 69
C8F8:00 00 00 00 00 00 00 00 8A
C900:00 00 00 00 00 00 00 00 93
C908:00 00 00 00 00 00 00 00 9B
C910:01 C0 00 07 60 00 01 F8 C2
C918:00 00 EE 00 00 EF 00 00 49
C920:73 80 00 7C CE 00 1F 78 82
C928:00 09 00 00 09 00 00 1B 61
C930:00 00 00 00 00 00 00 00 C3
C938:00 00 00 00 00 00 00 00 CB
C940:00 00 00 00 00 00 00 00 D3
C948:00 00 00 00 01 81 80 03 ED
C950:00 C0 06 C3 E0 07 00 E0 15
C958:0E 66 70 1C 24 38 4E 7E 79
C960:72 C5 FF A3 63 FF C6 3D BE
C968:FF BC 82 FF 41 7D 00 BE 3A
C970:03 00 C0 06 00 60 07 00 8D
C978:E0 00 00 00 00 00 00 00 7C
C980:00 00 00 00 00 00 00 00 14
C988:00 00 00 00 00 00 00 00 1C
C990:00 00 00 00 00 00 00 00 24
C998:3F 70 3F FF FC FF FF FB B3
C9A0:FF FF FE FF FF 80 7F DE F3
C9A8:00 7C 1E 00 3B 1D 80 3C AA
C9B0:1E 00 00 00 00 00 00 00 53
C9B8:00 00 00 00 00 00 00 00 4C
C9C0:00 0E 00 00 1E 00 00 36 FE
C9C8:00 00 07 00 00 03 00 00 49
C9D0:03 80 00 01 C0 00 01 E0 FE
C9D8:00 00 F0 00 00 FF 00 00 8A
C9E0:7B F0 00 3E D8 00 3F F0 88
C9E8:00 3C F8 00 38 38 00 28 75
C9F0:18 00 28 28 00 28 28 00 09
C9F8:28 28 00 68 68 00 18 18 BC
CA00:00 00 00 00 00 00 00 00 95
CA08:00 00 00 E0 00 00 78 00 9C
CA10:00 6F 00 00 B8 00 03 B0 FD
CA18:00 07 D0 00 1F 60 00 3F 43
CA20:60 00 7C C0 00 F3 80 07 59
CA28:FE 00 3F CA 00 FF 09 00 E3
CA30:F8 06 C0 60 00 00 00 00 E1
CA38:00 00 00 00 00 00 00 00 CD
CA40:00 00 00 00 00 00 06 00 E1
CA48:00 0E 00 00 1E 00 00 1C 6E
CA50:00 00 3C 1E 00 3C FC 03 3D
CA58:FF F8 1F FF E0 7F FE 00 13
CA60:F0 7F 80 00 FF E0 00 F3 D5
CA68:F8 03 E0 7C 03 C0 1C 07 79
CA70:80 00 06 00 00 00 00 00 07
CA78:00 00 00 00 00 00 00 00 0E
CA80:00 00 00 00 00 00 00 00 16
CA88:00 00 00 00 00 00 7E 00 1B
CA90:18 FF 18 0C FF 30 0C FF CE
CA98:30 0C 7E 30 66 18 66 3B B7
CAA0:7E DC 0F 7E F0 07 7E E0 F7
CAA8:1C 99 38 01 BD 80 03 24 E3
CAB0:C0 06 00 60 00 00 00 00 2E
CAB8:00 00 00 00 00 00 00 00 4E
CAC0:00 00 00 00 00 00 00 00 56
CAC8:00 00 00 00 00 00 00 00 5E
CAD0:66 00 1C 3C 38 37 3C EC E4
CAD8:61 C3 86 DA 7E 5B DB 7E 26
CAE0:DB DD BD BB CD BD B3 0D 29
CAE8:7E B0 00 DB 00 00 C3 00 2F
CAF0:00 00 00 00 00 00 00 00 86
CAF8:00 00 00 00 00 00 00 00 8E
CB00:00 00 00 00 00 00 18 00 C7
CB08:00 3C 00 14 5A 28 18 7E 12
CB10:18 0C 7E 30 07 7E E0 00 7D
CB18:7E 00 00 7E 00 38 7E 1C D0
CB20:7F 7E FE 1F BD F8 07 3C 05
CB28:E0 01 81 80 00 C3 00 03 BA
CB30:C3 C0 3E 00 7C 00 00 00 85
CB38:00 00 00 00 00 00 00 00 CF
CB40:00 00 00 00 01 01 00 00 E3
CB48:82 00 00 7C 00 18 FE 30 77
CB50:03 01 80 07 EF C0 0E 6C 35
CB58:E0 6F EF EC 0C EE 60 0F F4
CB60:EF E0 06 6C C0 03 EF 80 22
CB68:18 EE 30 30 00 18 00 00 31
CB70:00 00 00 00 00 00 00 00 08
CB78:00 00 A2 C7 86 FE A2 0C 62
CB80:86 FD AA E0 01 F0 11 CA F6
CB88:18 A5 FD 69 3F 85 FD A5 9D
CB90:FE 69 00 85 FE 4C 83 CB 56
CB98:60 00 00 00 00 00 00 00 60
```

BEFORE TYPING . . .

Before typing in programs, please refer to "How To Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

Snake Pit

See instructions in article on page 42 before typing in.

```
C000:78 A5 01 29 FB 85 01 A2 74
C008:00 BD 00 D0 9D 00 38 BD 21
C010:00 D1 9D 00 39 CA D0 F1 42
C018:A2 1F BD DB C9 9D E0 38 E6
C020:CA 10 F7 A2 6F BD FB C9 68
C028:9D 08 39 CA 10 F7 A2 17 0B
C030:BD 6B CA 9D D8 39 CA 10 EF
C038:F7 A5 01 09 04 85 01 58 60
C040:A9 1E 8D 18 D0 A9 5B 8D C2
C048:11 D0 A9 06 8D 22 D0 A9 5C
C050:00 8D 23 D0 A9 05 8D 24 47
C058:D0 A2 17 A9 00 9D 00 D4 B3
C060:CA 10 FA A9 0F 8D 18 D4 F8
C068:A9 93 20 D2 FF A9 00 8D 09
C070:20 D0 A9 0B 8D 21 D0 A9 58
C078:44 85 FB 85 FD A9 05 85 7B
C080:FC A9 D9 85 FE A2 08 A0 B1
C088:1F A9 01 91 FD A9 60 91 26
C090:FB 88 10 F5 18 A5 FB 69 4C
C098:28 85 FB A5 FC 69 00 85 7C
C0A0:FC 18 A5 FD 69 28 85 FD 30
C0A8:A5 FE 69 00 85 FE CA 10 B7
C0B0:D6 A2 0A BD AB CA 9D 76 9D
C0B8:05 CA 10 F7 A2 1C BD B6 A8
C0C0:CA 9D BD 05 CA 10 F7 A2 40
C0C8:17 BD D3 CA 9D 10 06 CA 70
C0D0:10 F7 A2 1C BD EB CA 9D 3F
C0D8:5D 06 CA 10 F7 A9 01 85 D2
C0E0:21 A9 1D 85 FB A9 06 85 71
C0E8:FC 20 E2 C1 20 16 C2 A2 EA
C0F0:01 BD 00 DC 85 02 29 10 C6
C0F8:D0 06 20 44 C9 4C 49 C1 80
C100:A5 02 29 04 D0 1C A5 21 9F
C108:F0 39 C6 21 20 EF C1 38 B9
C110:A5 FB E9 0E 85 FB A5 FC E7
C118:E9 00 85 FC 20 E2 C1 4C 6D
C120:43 C1 A5 02 29 08 D0 1B B0
C128:A5 21 C9 01 F0 15 E6 21 DA
C130:20 EF C1 18 A5 FB 69 0E 77
C138:85 FB A5 FC 69 00 85 FC 55
C140:20 E2 C1 CA 10 AB 4C EC 26
C148:C0 A2 1D BD 08 CB 9D BD BC
C150:05 CA 10 F7 A2 17 BD 26 9D
C158:CB 9D 10 06 CA 10 F7 A2 B4
C160:1C BD 3E CB 9D 5D 06 CA 1F
C168:10 F7 A9 21 85 20 A9 19 52
C170:85 FB A9 06 85 FC 20 FC A8
C178:C1 20 16 C2 A2 01 BD 00 68
C180:DC 85 02 29 10 D0 06 20 96
C188:44 C9 4C 21 C2 A5 02 29 16
C190:04 D0 23 A5 20 C9 41 F0 A4
C198:43 18 A5 20 69 10 85 20 31
C1A0:20 09 C2 38 A5 FB E9 04 47
C1A8:85 FB A5 FC E9 00 85 FC C9
C1B0:20 FC C1 4C DC C1 A5 02 BB
C1B8:29 08 D0 20 A5 20 C9 01 31
C1C0:F0 1A 38 A5 20 E9 10 85 F2
C1C8:20 20 09 C2 18 A5 FB 69 6A
C1D0:04 85 FB A5 FC 69 00 85 A4
C1D8:FC 20 FC C1 CA 10 9F 4C C0
C1E0:79 C1 A0 0A B1 FB 18 69 5D
C1E8:40 91 FB 88 D0 F6 60 A0 BC
C1F0:0A B1 FB 38 E9 40 91 FB 58
C1F8:88 D0 F6 60 A0 03 B1 FB 4A
C200:18 69 40 91 FB 88 D0 F6 A7
C208:60 A0 03 B1 FB 38 E9 40 36
C210:91 FB 88 D0 F6 60 A2 A0 9A
C218:A0 00 88 D0 FD CA D0 F8 C1
C220:60 A2 05 A9 00 95 39 CA 4D
C228:10 FB A9 00 8D 0A DD 8D C7
C230:09 DD 8D 08 DD A9 93 20 C0
C238:D2 FF A9 0E 8D 20 D0 A9 75
C240:09 8D 21 D0 A2 27 A9 01 E4
C248:9D 00 D8 BD 83 CA 9D 00 16
C250:04 CA 10 F2 A9 00 85 FB 10
C258:A9 04 85 FC A2 17 18 A5 7B
C260:FB 69 28 85 FB A5 FC 69 75
C268:00 85 FC A0 00 A9 60 91 F1
C270:FB A0 27 91 FB CA 10 E6 2C
C278:A0 27 A9 60 91 FB 88 10 F0
C280:FB A9 06 8D 40 D9 8D 80 0D
C288:DA 8D CD DB 8D DA DB 8D 73
C290:A7 DA 8D 67 D9 A9 BB 8D 43
C298:40 05 8D 80 06 A9 BC 8D 17
C2A0:CD 07 8D DA 07 A9 BD 8D 16
C2A8:A7 06 8D 67 05 20 77 C8 0C
C2B0:20 AB C8 A9 41 85 18 A9 DE
C2B8:05 85 1C A9 0C 8D 41 D9 33
C2C0:A9 1D 8D 41 05 A9 81 85 7F
C2C8:19 A9 06 85 1D A9 0C 8D 93
C2D0:81 DA A9 1D 8D 81 06 A9 FC
C2D8:A6 85 1A A9 06 85 1E A9 1D
C2E0:0C 8D A6 DA A9 1F 8D A6 DD
C2E8:06 A9 66 85 1B A9 05 85 10
C2F0:1F A9 0C 8D 66 D9 A9 1F D7
C2F8:8D 66 05 A2 07 A5 21 D0 8B
C300:36 A9 00 9D F0 D9 A9 22 4B
C308:9D F0 05 CA 10 F3 A9 2C B7
C310:8D F0 05 A9 24 8D F7 05 22
C318:A9 00 85 07 A9 01 85 09 FA
C320:A9 F7 85 0B A9 05 85 0D 55
C328:A9 F0 85 0F A9 05 85 11 DF
C330:A9 20 85 14 4C 92 C3 A9 64
C338:00 9D 50 D9 A9 22 9D 50 30
C340:05 A9 05 9D 90 DA A9 22 94
C348:9D 90 06 CA 10 E9 A9 2C D7
C350:8D 50 05 A9 24 8D 57 05 F8
C358:A9 26 8D 90 06 A9 2E 8D B9
C360:97 06 A9 00 85 07 A9 05 0B
C368:85 08 A9 01 85 09 A9 03 A0
C370:85 0A A9 57 85 0B A9 90 24
C378:85 0C A9 05 85 0D A9 06 05
C380:85 0E A9 50 85 0F A9 97 DB
C388:85 10 A9 05 85 11 A9 06 26
C390:85 12 20 77 C8 AD 0A DD C9
C398:C9 05 F0 69 AD 00 DC 29 4B
C3A0:0F 49 0F F0 ED A5 21 F0 2C
C3A8:09 AD 01 DC 29 0F 49 0F 35
C3B0:F0 E0 20 77 C8 AD 0A DD 53
C3B8:C9 05 F0 49 A6 20 A0 00 10
C3C0:88 D0 FD CA D0 F8 20 35 0D
C3C8:C4 A6 21 86 02 20 83 C5 46
C3D0:A6 02 CA 10 F6 A5 13 C9 C4
C3D8:21 B0 09 A5 14 C9 21 B0 53
C3E0:03 4C B2 C3 A9 0F 85 FB 20
C3E8:20 77 C8 AD 0A DD C9 05 B2
C3F0:F0 13 A2 00 A0 00 88 D0 F0
C3F8:FD CA D0 F8 C6 FB A5 FB 49
C400:D0 E6 4C 35 C2 A9 70 8D B3
C408:12 04 8D 14 04 8D 15 04 13
C410:20 66 C9 A2 1B A9 01 9D C5
C418:C6 DB BD 5B CB 9D C6 07 D2
C420:CA 10 F2 A2 01 BD 00 DC 77
C428:29 10 F0 06 CA 10 F6 4C 99
C430:23 C4 4C 59 C0 A2 03 86 B8
C438:02 B5 18 85 FB B5 1C 85 FF
C440:FC A0 00 B1 FB C9 20 90 63
C448:7E 20 97 E0 A5 8D C9 2A 3B
C450:B0 0F A9 41 85 FB A9 05 B3
C458:85 FC A9 1D 85 15 4C B9 BD
C460:C4 C9 55 B0 0F A9 81 85 1C
C468:FB A9 06 85 FC A9 1D 85 C1
C470:15 4C B9 C4 C9 7F B0 0F D7
C478:A9 A5 85 FB A9 07 85 FC 22
C480:A9 1C 85 15 4C B9 C4 C9 84
C488:A9 B0 0F A9 B2 85 FB A9 DC
C490:07 85 FC A9 1C 85 15 4C A6
C498:B9 C4 C9 D4 B0 0F A9 A6 72
C4A0:85 FB A9 06 85 FC A9 1F 14
C4A8:85 15 4C B9 C4 A9 66 85 7E
C4B0:FB A9 05 85 FC A9 1F 85 ED
C4B8:15 A0 00 B1 FB C9 20 D0 28
C4C0:03 4C 5B C5 4C 7A C5 85 04
C4C8:15 20 97 E0 A5 8D 10 3B A4
C4D0:20 97 E0 A5 8D 10 1A 38 DF
C4D8:A5 FB E9 28 85 FD A5 FC 60
C4E0:E9 00 85 FE A9 1C 85 16 DE
C4E8:A5 15 C9 1E F0 6D 4C 43 BE
C4F0:C5 18 A5 FB 69 01 85 FD 30
C4F8:A5 FC 69 00 85 FE A9 1D 5A
C500:85 16 A5 15 C9 1F F0 53 D9
C508:4C 43 C5 20 97 E0 A5 8D 5E
C510:10 1A 18 A5 FB 69 28 85 E2
C518:FD A5 FC 69 00 85 FE A9 FF
C520:1E 85 16 A5 15 C9 1C F0 32
C528:32 4C 43 C5 38 A5 FB E9 DE
C530:01 85 FD A5 FC E9 00 85 CC
C538:FE A9 1F 85 16 A5 15 C9 25
C540:1D F0 18 A0 00 B1 FD C9 30
C548:20 D0 10 A9 20 91 FB A5 99
C550:FD 85 FB A5 FE 85 FC A5 C3
C558:16 85 15 A5 FB 85 FD 18 57
C560:A5 FC 69 D4 85 FE A0 00 E1
C568:A9 0C 91 FD A5 15 91 FB 7E
C570:A6 02 A5 FB 95 18 A5 FC 99
C578:95 1C A6 02 CA 30 03 4C 34
C580:37 C4 60 B5 09 85 15 85 4E
C588:16 BD 00 DC 29 0F 85 17 04
C590:29 01 D0 07 A9 00 85 16 E9
C598:4C BF C5 A5 17 29 08 D0 8B
C5A0:07 A9 01 85 16 4C BF C5 B9
C5A8:A5 17 29 02 D0 07 A9 02 0A
C5B0:85 16 4C BF C5 A5 17 29 26
C5B8:04 D0 04 A9 03 85 16 B5 A5
C5C0:0B 85 FB 85 FD B5 0D 85 71
C5C8:FC 85 FE A5 15 D0 0B A5 16
C5D0:16 AA BD 77 CB 85 17 4C 30
C5D8:00 C6 C9 01 D0 0B A5 16 73
C5E0:AA BD 7B CB 85 17 4C 00 7E
C5E8:C6 C9 02 D0 0B A5 16 AA 5D
C5F0:BD 7F CB 85 17 4C 00 C6 BD
C5F8:A5 16 AA BD 83 CB 85 17 7B
C600:A5 16 D0 10 38 A5 FB E9 3B
C608:28 85 FD A5 FC E9 00 85 3A
C610:FE 4C 49 C6 C9 01 D0 10 C9
C618:18 A5 FB 69 01 85 FD A5 F0
C620:FC 69 00 85 FE 4C 49 C6 61
C628:C9 02 D0 10 18 A5 FB 69 EE
C630:28 85 FD A5 FC 69 00 85 60
C638:FE 4C 49 C6 38 A5 FB E9 28
C640:01 85 FD A5 FC E9 00 85 DE
C648:FE A6 02 A5 16 95 09 A0 53
C650:00 B1 FD 95 13 C9 21 90 F5
C658:03 4C 6F C7 A5 17 91 FB 8D
C660:A5 FE 18 69 D4 85 FE B5 8A
C668:07 91 FD A5 FE 38 E9 D4 79
C670:85 FE A9 23 18 65 16 91 FB
C678:FD A5 FD 95 0B A5 FE 95 0A
C680:0D B5 13 C9 20 F0 10 20 06
C688:24 C9 20 24 C9 20 24 C9 C1
C690:20 AB C8 20 8A C9 60 B5 26
C698:0F 85 FB B5 11 85 FC A0 23
C6A0:00 B1 FB 85 15 A9 20 91 93
C6A8:FB A5 15 C9 2B D0 2E 38 0E
C6B0:A5 FB E9 28 85 FB A5 FC 34
C6B8:E9 00 85 FC A5 FB 95 0F 13
C6C0:A5 FC 95 11 B1 FB C9 28 5D
C6C8:D0 05 A9 2E 91 FB 60 C9 1F
C6D0:21 D0 05 A9 2B 91 FB 60 56
C6D8:A9 2C 91 FB 60 C9 2C D0 8B
C6E0:2E 18 A5 FB 69 01 85 FB 56
C6E8:A5 FC 69 00 85 FC A5 FB 1D
C6F0:95 0F A5 FC 95 11 B1 FB E1
C6F8:C9 29 D0 05 A9 2B 91 FB 39
C700:60 C9 22 D0 05 A9 2C 91 3C
C708:FB 60 A9 2D 91 FB 60 C9 BC
C710:2D D0 2E 18 A5 FB 69 28 C9
C718:85 FB A5 FC 69 00 85 FC 41
C720:A5 FB 95 0F A5 FC 95 11 82
C728:B1 FB C9 2A D0 05 A9 2C 85
C730:91 FB 60 C9 21 D0 05 A9 30
C738:2D 91 FB 60 A9 2E 91 FB 6D
C740:60 38 A5 FB E9 01 85 FB DC
C748:A5 FC E9 00 85 FC A5 FB 8E
C750:95 0F A5 FC 95 11 B1 FB 43
C758:C9 27 D0 05 A9 2D 91 FB 22
C760:60 C9 22 D0 05 A9 2E 91 A0
C768:FB 60 A9 2B 91 FB 60 20 53
```

```
C770:AE C9 A6 02 B5 0F 85 FB AF
C778:B5 11 85 FC B1 FB 85 15 45
C780:A5 FB 85 FD 18 A5 FC 69 2D
C788:D4 85 FE A9 07 91 FD A5 7E
C790:21 F0 11 A2 00 E4 02 D0 A1
C798:02 A2 01 20 24 C9 20 24 A0
C7A0:C9 20 AB C8 A6 02 B5 0B D2
C7A8:C5 FB D0 07 B5 0D C5 FC 0F
C7B0:D0 01 60 A5 15 C9 2B D0 46
C7B8:32 38 A5 FB E9 28 85 FB DA
C7C0:A5 FC E9 00 85 FC B1 FB 1F
C7C8:C9 28 D0 0D A9 2E 85 15 58
C7D0:4C 80 C7 A0 00 B1 FB 85 ED
C7D8:15 C9 21 D0 07 A9 2B 85 51
C7E0:15 4C 80 C7 A9 2C 85 15 B8
C7E8:4C 80 C7 C9 2C D0 2C 18 69
C7F0:A5 FB 69 01 85 FB A5 FC F3
C7F8:69 00 85 FC B1 FB C9 29 F7
C800:D0 07 A9 2B 85 15 4C 80 3D
C808:C7 C9 22 D0 07 A9 2C 85 FD
C810:15 4C 80 C7 A9 2D 85 15 ED
C818:4C 80 C7 C9 2D D0 2C 18 A2
C820:A5 FB 69 28 85 FB A5 FC 97
C828:69 00 85 FC B1 FB C9 2A 2A
C830:D0 07 A9 2C 85 15 4C 80 7D
C838:C7 C9 21 D0 07 A9 2D 85 10
C840:15 4C 80 C7 A9 2E 85 15 22
C848:4C 80 C7 38 A5 FB E9 01 8E
C850:85 FB A5 FC E9 00 85 FC 7F
C858:B1 FB C9 27 D0 07 A9 2D 90
C860:85 15 4C 80 C7 C9 22 D0 06
C868:07 A9 2E 85 15 4C 80 C7 A8
C870:A9 2B 85 15 4C 80 C7 AE 46
C878:0A DD AD 09 DD F0 09 E8 7A
C880:A9 60 F8 38 ED 09 DD D8 C9
C888:85 02 4A 4A 4A 4A 09 70 49
C890:8D 14 04 A5 02 29 0F 09 A4
C898:70 8D 15 04 86 02 A9 05 3D
C8A0:F8 38 E5 02 D8 09 70 8D F2
C8A8:12 04 60 A5 39 29 0F 09 40
C8B0:B0 8D 07 04 A5 39 4A 4A 10
C8B8:4A 4A 09 B0 8D 06 04 A5 60
C8C0:3B 29 0F 09 B0 8D 05 04 76
C8C8:A5 3B 4A 4A 4A 4A 09 B0 28
C8D0:8D 04 04 A5 3D 29 0F 09 BA
C8D8:B0 8D 03 04 A5 3D 4A 4A C7
C8E0:4A 4A 09 B0 8D 02 04 A5 78
C8E8:3A 29 0F 09 F0 8D 25 04 60
C8F0:A5 3A 4A 4A 4A 4A 09 F0 50
C8F8:8D 24 04 A5 3C 29 0F 09 E2
C900:F0 8D 23 04 A5 3C 4A 4A 11
C908:4A 4A 09 F0 8D 22 04 A5 26
C910:3E 29 0F 09 F0 8D 21 04 83
C918:A5 3E 4A 4A 4A 4A 09 F0 7A
C920:8D 20 04 60 B5 39 F8 18 A5
C928:69 10 D8 95 39 90 14 B5 D2
C930:3B F8 18 69 01 D8 95 3B 0B
C938:90 09 B5 3D F8 18 69 01 DC
C940:D8 95 3D 60 A9 00 8D 00 BB
C948:D4 8D 05 D4 A9 40 8D 01 02
C950:D4 A9 F8 8D 06 D4 A9 11 98
C958:8D 04 D4 A2 80 20 D2 C9 6C
C960:A9 10 8D 04 D4 60 A9 00 3A
C968:8D 00 D4 A9 0C 8D 01 D4 65
C970:A9 24 8D 05 D4 A9 FC 8D B8
C978:06 D4 A9 21 8D 04 D4 A2 54
C980:A0 20 D2 C9 A9 20 8D 04 50
C988:D4 60 A9 00 8D 07 D4 A9 AF
C990:C0 8D 08 D4 A9 20 8D 0C 2B
C998:D4 A9 42 8D 0D D4 A9 21 52
C9A0:8D 0B D4 A2 10 20 D2 C9 F2
C9A8:A9 20 8D 0B D4 60 A9 02 F8
C9B0:8D 0E D4 A9 0A 8D 0F D4 3D
C9B8:A9 02 8D 13 D4 A9 8C 8D 78
C9C0:14 D4 A9 81 8D 12 D4 A2 E1
C9C8:10 20 D2 C9 A9 80 8D 12 DF
C9D0:D4 60 A0 00 88 D0 FD CA 49
C9D8:D0 F8 60 00 18 3C FF 7E 4F
C9E0:FF 7E 3C 00 76 FE FF FF 4B
C9E8:FE 76 00 3C 7E FF 7E FF 4E
C9F0:3C 18 00 00 6E 7F FF FF 1A
C9F8:7F 6E 00 7E 7E 7E 7E 7E 39
CA00:7E 7E 7E 00 00 FF FF FF 44
CA08:FF 00 00 00 00 00 3C 3C 7E 85
CA10:FF FF FF 00 F0 FC FF FF 21
CA18:FC F0 00 FF FF FF 7E 3C A1
CA20:3C 00 00 00 0F 3F FF FF 49
CA28:3F 0F 00 00 00 0F 1F 3F DA
CA30:7F 7F 7E 00 00 F0 F8 FC E7
CA38:FE FE 7E 7E FE FE FC F8 AB
CA40:F0 00 00 7E 7F 7F 3F 1F CD
CA48:0F 00 00 3C 3C 3C 18 18 44
CA50:18 00 00 00 00 0F FF FF 2E
CA58:0F 00 00 00 00 18 18 18 1E
CA60:3C 3C 3C 00 00 F0 FF FF 6E
CA68:F0 00 00 FF FC F8 F8 F8 2D
CA70:F8 FC FF 00 00 81 C3 FF 4F
CA78:FF FF FF FF 3F 1F 1F 1F E1
CA80:1F 3F FF A0 A0 B0 B0 B0 59
CA88:B0 B0 B0 A0 A0 60 60 60 6A
CA90:60 60 60 60 60 70 7A 70 AA
CA98:70 60 60 60 60 60 60 60 36
CAA0:60 E0 E0 F0 F0 F0 F0 F0 E7
CAA8:F0 E0 E0 A0 93 8E 81 8B 7A
CAB0:85 A0 90 89 94 A0 4D 4F EC
CAB8:56 45 60 4A 4F 59 53 54 56
CAC0:49 43 4B 60 54 4F 60 53 2F
CAC8:45 4C 45 43 54 60 47 41 E4
CAD0:4D 45 7A A0 B1 A0 90 8C 75
CAD8:81 99 85 92 A0 60 60 60 17
CAE0:60 A0 B2 A0 90 8C 81 99 82
CAE8:85 92 A0 50 52 45 53 53 A0
CAF0:60 46 49 52 45 60 42 55 1C
CAF8:54 54 4F 4E 60 54 4F 60 EF
CB00:43 4F 4E 54 49 4E 55 45 8F
CB08:4D 4F 56 45 60 4A 4F 59 5D
CB10:53 54 49 43 4B 60 54 4F 97
CB18:60 53 45 4C 45 43 54 60 62
CB20:53 50 45 45 44 7A 60 60 9F
CB28:A0 B1 A0 60 A0 B2 A0 60 08
CB30:A0 B3 A0 60 A0 B4 A0 60 98
CB38:A0 B5 A0 60 60 60 60 60 4D
CB40:50 52 45 53 53 60 46 49 64
CB48:52 45 60 42 55 54 54 4F 7E
CB50:4E 60 54 4F 60 42 45 47 84
CB58:49 4E 60 47 41 4D 45 60 D2
CB60:4F 56 45 52 7A 60 50 52 4B
CB68:45 53 53 60 46 49 52 45 29
CB70:60 42 55 54 54 4F 4E 21 56
CB78:27 21 28 29 22 28 22 21 9A
CB80:2A 21 29 2A 22 27 22 00 2F
```

BEFORE TYPING . . .

Before typing in programs, please refer to "How To Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

Crossroads

See instructions in article on page 38 before typing in.

```
0801:0B 08 0A 00 9E 32 33 30 2E
0809:30 00 00 00 00 00 44 AA 64
0811:AA 11 00 00 00 00 11 AA 87
0819:AA 44 00 00 00 00 00 3C CB
0821:3C 00 00 00 00 00 00 3C 8B
0829:3C 00 00 00 38 38 30 7F D9
0831:BE 68 CE EC 38 38 30 7F E5
0839:76 30 30 38 FF 8F FF 3C 94
0841:7E 7E EE 87 FF F1 FF 3C 8A
0849:7E 7E 38 3C C7 8D BF FC F3
0851:FF EC C6 C3 27 6D 9F FF DF
0859:3F 3C 30 38 3C 72 FF F0 3E
0861:7E 1C 66 73 3C 72 FF F8 60
0869:7E 10 10 18 7E CF F8 F0 56
0871:F8 7F E6 87 3F CF FF F0 5D
0879:FF 7F 30 38 7C 6C FF F0 79
0881:F0 FF 84 E7 7C 6C FF FA A9
0889:F5 FF 18 1C E0 8F 89 FF B1
0891:FC FF C2 83 20 EF 89 FF 84
0899:F8 FF 4C 68 18 3E 78 FF E0
08A1:FF 6C C6 67 18 3E 78 FF C6
08A9:FF 38 38 3C 3C 38 3C 7F 4D
08B1:BC 3C 77 64 3C 38 3C 7C 1C
08B9:7C 3C 18 1C 00 00 3C B9 0E
08C1:FE 7C 44 66 3C 38 78 FF 13
08C9:6C 48 00 00 80 40 20 10 77
08D1:08 04 02 01 02 04 08 10 77
08D9:20 40 80 7E FF FF FF FF 02
08E1:FF FF 7E FF 81 81 81 81 58
08E9:81 81 FF FF FF BD 99 99 DE
08F1:BD FF FF 3C E7 BD 66 66 0E
08F9:BD E7 3C A9 FF 8D 0E D4 2C
0901:8D 0F D4 A9 80 8D 12 D4 06
0909:A9 03 85 02 A9 00 8D 4B 35
0911:0B A9 28 8D 4C 0B A2 31 F5
0919:20 52 0B 69 0A 9D 00 20 AE
0921:20 52 0B 69 08 9D 00 21 A7
0929:20 52 0B C9 03 F0 F9 C9 77
0931:02 D0 02 A9 FF 9D 00 22 EB
0939:20 52 0B D0 07 A8 BD 00 B4
0941:22 F0 E5 98 C9 03 F0 F0 14
0949:C9 02 D0 02 A9 FF 9D 00 83
0951:23 20 52 0B 9D 00 24 9D CA
0959:00 25 CA 10 BB A9 15 85 43
0961:FB A9 00 A0 3E 20 4A 0B F7
0969:88 10 FA A2 31 BD 00 25 F2
0971:C9 FF D0 1E BD 00 20 18 AA
0979:7D 00 22 9D 00 20 C9 18 94
0981:B0 4C BD 00 21 18 7D 00 1B
0989:23 9D 00 21 BD 00 24 9D 7A
0991:00 25 BD 00 20 4A 4A 4A AD
0999:85 FC 0A 0A 0A 85 FD BD AF
09A1:00 20 38 E5 FD A8 B9 CD F4
09A9:08 85 FD AD 4C 0B 8D 50 B5
09B1:0B AD 4B 0B 8D 4F 0B BD 4C
09B9:00 21 0A 18 7D 00 21 18 1D
09C1:65 FC A8 20 4E 0B 05 FD 83
09C9:20 4A 0B DE 00 25 CA 10 08
09D1:9C AD 4B 0B C9 C0 D0 07 B1
09D9:EE 4C 0B A9 00 F0 03 18 54
09E1:69 40 8D 4B 0B C6 FB 30 BA
09E9:03 4C 62 09 C6 02 30 03 0F
09F1:4C 17 09 A9 00 8D 0E DC DA
09F9:A9 73 85 01 A2 00 BD 00 0F
0A01:D0 9D 00 20 BD EC D0 9D C7
0A09:EC 20 E8 E0 EC D0 EF A9 FA
0A11:77 85 01 A9 01 8D 0E DC 34
0A19:A9 18 8D 18 D0 A9 80 8D F6
0A21:37 0B A9 21 8D 38 0B A9 E7
0A29:0B 85 02 AD 37 0B 10 03 48
0A31:EE 38 0B 18 69 80 8D 37 4D
0A39:0B A9 00 AA 20 36 0B E8 C0
0A41:E0 80 D0 F8 A5 02 0A 0A E2
0A49:0A 0A A8 A2 00 B9 0D 08 2D
0A51:20 36 0B C8 E8 E0 08 D0 9C
0A59:F4 B9 0D 08 4A 4A 4A 4A D2
0A61:20 36 0B E8 C8 E0 10 D0 BD
0A69:F0 B9 05 08 0A 0A 0A 0A 1C
0A71:20 36 0B E8 C8 E0 18 D0 DD
0A79:F0 B9 FD 07 20 36 0B E8 7D
0A81:C8 E0 20 D0 F4 20 A9 0A C8
0A89:A0 00 A2 40 20 DA 0A A0 67
0A91:20 A2 60 20 DA 0A C6 02 FA
0A99:10 91 A2 1F BD DC 08 9D 6F
0AA1:D8 21 CA 10 F7 4C 58 0B 71
0AA9:A9 00 85 FC 8A 38 E9 20 3C
0AB1:A8 20 3A 0B A4 FC 39 CD 73
0AB9:08 D9 CD 08 D0 0E 8A A8 FE
0AC1:20 3A 0B A4 FC 18 79 D4 30
0AC9:08 20 36 0B C8 84 FC C0 74
0AD1:08 D0 D9 E8 E0 40 D0 D0 62
0AD9:60 86 FC 84 FD A9 04 85 CB
0AE1:FB A9 00 85 03 A9 00 85 FA
0AE9:FE A5 FE 18 65 FD A8 20 DC
0AF1:3A 0B A6 03 3D CD 08 DD F9
0AF9:CD 08 D0 16 A5 03 18 65 41
0B01:FC A8 20 3A 0B 18 A6 FE 6C
0B09:7D D4 08 48 98 AA 68 20 F8
0B11:36 0B E6 FE A5 FE C9 08 96
0B19:D0 CF E6 03 A5 03 C9 08 6D
0B21:D0 C3 A5 FC 18 69 08 85 11
0B29:FC A5 FD 18 69 08 85 FD DC
0B31:C6 FB D0 AD 60 9D FF FF 18
0B39:60 AD 37 0B 8D 47 0B AD CF
0B41:38 0B 8D 48 0B B9 FF FF AB
```

```
0B49:60 99 00 00 60 B9 00 00 DF
0B51:60 AD 1B D4 29 03 60 A9 73
0B59:CC 8D 16 D0 A9 FF 8D 15 86
0B61:D0 A9 00 8D 21 D0 8D 20 AA
0B69:D0 8D 1B D0 8D 1D D0 8D CB
0B71:17 D0 8D CD D0 A2 07 A9 9E
0B79:A0 9D F8 07 A9 00 9D 46 A5
0B81:3F CA 10 F3 8D D8 3F 8D 07
0B89:D9 3F A2 04 A8 8D 76 3F 98
0B91:99 00 3F 48 8A 99 19 3F 0D
0B99:C8 C0 19 F0 09 68 18 69 F9
0BA1:28 90 ED E8 B0 EA 78 A9 08
0BA9:C4 8D 14 03 A9 11 8D 15 F9
0BB1:03 58 A9 00 A2 07 86 0D DF
0BB9:8E AA 3F 9D 32 3F 9D 3A 87
0BC1:3F 9D BE 3F CA 10 F4 AA D5
0BC9:9D 00 47 9D 00 4D E8 D0 49
0BD1:F7 8D 44 3F A9 01 8D 45 75
0BD9:3F 8D C6 3F A9 AC A0 0C 0D
0BE1:20 1E AB 20 0D 0E A2 08 F4
0BE9:86 06 BD 58 11 85 05 C6 71
0BF1:05 30 11 20 AC 14 A5 06 C1
0BF9:20 8A 15 AE AA 3F 20 55 38
0C01:14 4C F0 0B A6 06 CA 10 F7
0C09:DF A2 00 8E D2 3F A9 82 0C
0C11:A0 0D 20 1E AB AE D2 3F 9F
0C19:BD D7 0C C9 F0 90 0A 38 3A
0C21:E9 F0 85 3A EE D2 3F D0 D0
0C29:EC 8D 4E 04 A5 3A 8D 4E A4
0C31:D8 AD D2 3F 29 01 F0 29 C7
0C39:AD 00 DC C9 7F F0 0A 29 5D
0C41:10 D0 03 4C C5 0D 20 78 D5
0C49:0C AD 01 DC C9 FF F0 11 02
0C51:29 10 D0 0A AD 20 04 C9 7C
0C59:31 F0 06 4C C5 0D 20 78 E6
0C61:0C A9 08 8D D3 3F A9 00 B2
0C69:85 A2 20 89 0C AE D2 3F 89
0C71:E8 E0 AB D0 96 F0 92 AD 04
0C79:20 04 C9 31 F0 04 A9 31 0B
0C81:D0 02 A9 32 8D 20 04 60 30
0C89:A6 CB BD 81 EB C9 31 90 31
0C91:0F C9 3A B0 0B 38 E9 31 34
0C99:48 20 AC 14 68 20 8A 15 A2
0CA1:20 55 17 A5 A2 CD D3 3F 8F
0CA9:90 F6 60 93 1C 20 20 20 CE
0CB1:43 52 4F 53 53 52 4F 41 E2
0CB9:44 53 20 20 20 20 20 20 B0
0CC1:20 20 20 20 20 20 20 20 D9
0CC9:20 20 20 20 20 9E 31 50 2E
0CD1:4C 41 59 45 52 00 F6 2E 8E
0CD9:2E 2E 03 0F 10 19 12 09 F7
0CE1:07 08 14 20 31 39 38 37 1A
0CE9:20 03 0F 0D 10 15 14 05 87
0CF1:21 20 10 15 02 0C 09 03 4B
0CF9:01 14 09 0F 0E 13 2E 2E F0
0D01:2E F5 10 12 05 13 13 20 8D
0D09:06 09 12 05 20 02 15 14 42
0D11:14 0F 0E 20 14 0F 20 13 EC
0D19:14 01 12 14 2E 2E 2E F4 7C
0D21:10 0F 09 0E 14 20 16 01 57
0D29:0C 15 05 13 20 3A 20 20 AA
0D31:F6 40 20 35 30 20 20 FA 6B
0D39:50 20 31 35 30 20 20 F3 33
0D41:60 20 33 30 30 20 20 F8 38
0D49:70 20 34 30 30 20 20 F5 65
0D51:80 20 36 30 30 20 20 F7 B7
0D59:90 20 31 30 30 30 20 20 8F
0D61:FE A0 20 31 30 30 30 20 FC
0D69:20 F9 B0 20 31 31 30 30 09
0D71:20 20 F4 C0 20 31 35 30 AE
0D79:30 20 20 F1 3F 20 35 30 EB
0D81:30 13 11 1D 14 00 13 1C 4F
0D89:50 4C 41 59 45 52 20 31 81
0D91:20 96 53 20 9E 4C 1F 20 52
0D99:20 20 48 49 47 48 20 20 25
0DA1:1E 4C 45 56 45 4C 20 1C A3
0DA9:50 4C 41 59 45 52 20 32 A2
0DB1:20 96 53 20 9E 4C 00 00 14
0DB9:00 37 6E A5 02 04 05 06 F9
0DC1:08 09 0B 0E A0 04 A9 03 CF
0DC9:84 11 85 14 AE 20 04 E0 3B
0DD1:31 D0 03 A9 00 A8 84 12 71
0DD9:85 15 A9 87 A0 0D 20 1E 41
0DE1:AB A2 27 BD 00 D8 9D 28 02
0DE9:D8 A9 20 9D 28 04 CA 10 AF
0DF1:F2 20 CD 0E A2 00 86 3A 84
0DF9:A6 3A BD 00 47 F0 03 20 D1
0E01:94 16 E6 3A D0 F2 4C D3 2C
0E09:12 20 CD 0E 20 52 0B 18 49
0E11:69 3B CD D6 3F F0 F5 8D 0F
0E19:D6 3F AD 1B D4 29 07 AA DB
0E21:BD BD 0D CD D5 3F F0 F2 8A
0E29:8D D5 3F A9 00 8D D7 3F 29
0E31:AE 45 3F AD 44 3F D0 04 7D
0E39:E0 05 90 15 20 52 0B F0 BB
0E41:03 8D D7 3F 20 52 0B AA 3C
0E49:E8 EC D4 3F F0 F6 8E D4 F8
0E51:3F BD B8 0D 85 02 A9 00 EB
0E59:85 03 85 FD A0 02 A6 02 E5
0E61:AD D7 3F D0 06 BD 65 0F 40
0E69:4C 6F 0E BD 41 10 A6 03 BF
0E71:3D CD 08 F0 04 AD D6 3F 73
0E79:2C A9 20 85 06 A6 FD 20 59
0E81:22 0F AD D5 3F 20 42 0F 93
0E89:A9 26 38 E5 FD AA A5 06 55
0E91:20 22 0F AD D5 3F 20 42 31
0E99:0F E6 03 E6 FD A5 03 C9 1C
0EA1:08 D0 06 A9 00 85 03 E6 54
0EA9:02 A5 FD C9 14 D0 AF C8 98
0EB1:C0 18 F0 06 A9 00 85 FD 09
0EB9:F0 A4 A2 27 BD 50 04 9D 13
0EC1:C0 07 AD D5 3F 9D C0 DB E0
0EC9:CA 10 F1 60 A2 07 BD 32 72
0ED1:3F 18 69 30 9D 28 04 BD 17
0ED9:3A 3F 18 69 30 9D 43 04 FE
0EE1:BD 46 3F 18 69 30 9D 35 54
0EE9:04 CA 10 E2 A5 11 18 69 F5
0EF1:30 8D 33 04 A5 12 18 69 3F
0EF9:30 8D 4E 04 AD 44 3F 18 B0
0F01:69 30 8D 3F 04 AD 45 3F 26
0F09:18 69 30 8D 40 04 AD 00 D9
0F11:47 18 69 30 8D 31 04 AD EF
0F19:01 47 18 69 30 8D 4C 04 77
0F21:60 85 0C A9 9D 8D 3E 0F 9B
0F29:D0 05 A9 BD 8D 3E 0F B9 3F
0F31:00 3F 8D 3F 0F B9 19 3F 95
0F39:8D 40 0F A5 0C BD 00 04 C5
0F41:60 85 0C A9 9D 8D 61 0F 02
0F49:D0 05 A9 BD 8D 61 0F B9 EB
0F51:00 3F 8D 62 0F B9 19 3F E7
0F59:18 69 D4 8D 63 0F A5 0C FF
0F61:BD 00 04 60 FF FF 78 00 D5
0F69:10 AE FC 7A 80 10 22 FF 0B
0F71:7A A4 00 AB 40 0A 04 00 E2
0F79:B7 40 00 40 00 BD 40 08 07
0F81:14 00 EF 40 08 04 00 B7 B3
0F89:FF 70 00 00 AA AF 7A 8A 57
0F91:00 AE BF 78 08 80 BE 2B C5
0F99:58 08 00 FF FB F0 20 00 C9
0FA1:B8 DB 60 20 00 EF FB F0 C9
0FA9:00 00 DA 00 18 A0 01 AA 13
0FB1:00 1A A0 01 00 00 1A BE 6D
0FB9:BF A8 28 18 28 2D BA BA 8E
0FC1:D0 00 00 EF FB F8 00 00 0B
0FC9:AE 00 0A 20 00 B8 00 08 6D
0FD1:20 00 FF FB F8 00 10 BA 62
0FD9:FD 78 20 00 D7 FF E9 08 B3
0FE1:00 BE 80 08 28 00 BA 80 77
0FE9:00 00 00 AA 80 0A A8 00 30
0FF1:00 80 0B E8 00 80 FF ED 10
0FF9:A0 00 8A FE DA 80 24 AB 76
1001:EB 5A 00 80 BB EB F8 00 35
1009:80 FF 77 E8 01 00 BF 55 C3
1011:F2 00 40 AF F5 78 00 10 4F
1019:FF D7 50 00 00 00 56 F0 D6
1021:05 08 00 57 B0 00 00 BE 7F
1029:D5 F8 00 00 82 F7 DD A0 C2
1031:01 8B F7 FA 00 00 AF 77 3A
1039:A8 10 42 AC 75 E8 10 00 34
1041:DD DD D0 00 00 00 00 00 E1
1049:00 00 00 00 04 00 40 00 0A
1051:00 00 00 00 00 00 00 00 71
1059:00 01 00 00 00 00 00 00 B9
1061:00 00 00 00 00 04 00 40 D1
1069:00 00 00 00 00 00 00 00 89
1071:00 00 01 00 08 00 01 FB EF
1079:FF D8 20 21 BA EA DA 2B 48
1081:A1 2E 0A DA 2E A1 BA 00 5A
1089:D8 2A BD FE A8 58 02 B5 A8
1091:AF E8 5A 80 B5 AB 5A 5A 82
1099:85 2D AE D6 DA 28 01 BA 3F
10A1:EB D8 22 91 AF AC 58 80 AC
10A9:51 AA F5 D8 A0 41 FF FB 6F
10B1:78 00 04 BB EF 10 00 05 0F
10B9:FB EF 10 80 04 AB FF 78 25
10C1:00 00 B6 02 0A 20 20 2A 14
10C9:02 0E A7 FF 02 02 0D A0 36
10D1:20 02 02 0B A0 00 A2 FF BD
10D9:FA 80 00 AE AA A8 82 80 FF
10E1:AA A3 F8 00 80 FA BF E8 B7
10E9:AA 00 AE EF FA 00 00 AF BB
10F1:EF E0 00 00 00 00 30 00 A2
10F9:08 00 02 30 00 88 00 22 A5
1101:30 08 88 00 22 30 00 88 A8
1109:00 02 30 00 08 00 00 30 22
1111:00 00 BF B5 F8 00 40 BE 8D
1119:FD F8 00 10 00 00 04 FC 7E
1121:04 FC 00 00 00 00 01 FF 86
1129:01 FF 00 00 00 01 02 80 54
1131:00 01 03 80 00 01 80 00 01
1139:24 01 19 02 0F 03 0C 01 8E
1141:22 02 0A 03 10 04 14 03 22
1149:18 04 10 05 18 06 10 05 C8
1151:13 06 12 07 14 08 0F 14 24
1159:0F 0A 09 08 07 06 04 05 84
1161:03 01 25 A0 B6 CC E2 08 AA
1169:0C 00 04 00 0A 14 1E 28 17
1171:32 3C 46 50 5A 64 6E 78 43
1179:82 8C 01 00 03 02 02 03 47
1181:00 08 10 02 05 14 03 02 48
1189:15 FF 01 00 30 12 1E 78 D4
1191:48 0C 00 00 18 08 7A 5E 0F
1199:10 18 00 00 0C 64 58 1A 86
11A1:26 30 00 FF FF FF 05 06 F2
11A9:03 04 FF 09 08 FF FF FF 1F
11B1:FF FF FF 00 07 21 81 11 A4
11B9:11 03 00 10 40 07 1F 0F 91
11C1:07 8F 00 AE 76 3F BD C2 25
11C9:11 8D 18 D4 D0 03 4C D0 24
11D1:12 A2 01 8E DD 3F BD 91 A7
11D9:3F F0 03 DE 91 3F BD B7 E2
11E1:3F F0 03 DE B7 3F A5 A2 D6
11E9:29 01 F0 60 BD D8 3F F0 C5
11F1:5B BC B4 11 C9 05 90 1E 3A
11F9:D0 07 BD DA 3F A2 21 D0 43
1201:2A C9 07 F0 07 BD DA 3F C0
1209:A2 81 D0 1F BD DA 3F 18 DA
1211:69 F6 A2 81 D0 15 AA AD F1
1219:1B D4 3D BD 11 18 7D B9 21
1221:11 8D DC 3F BD B5 11 AA 52
1229:AD DC 3F 99 01 D4 A9 09 94
1231:99 05 D4 A9 00 99 04 D4 DB
1239:8A 99 04 D4 AE DD 3F DE 21
1241:DA 3F D0 08 A9 00 9D D8 9E
1249:3F 99 04 D4 CA CE DD 3F CD
1251:10 84 CE D0 3F D0 1F A9 AA
1259:04 8D D0 3F AE CF 3F CA EE
1261:10 02 A2 02 8E CF 3F BC 71
1269:81 11 A2 07 B9 8C 11 9D 17
1271:F8 21 C8 CA 10 F6 CE AB C5
1279:3F D0 0A A9 01 8D 95 3F F5
1281:A9 04 8D AB 3F CE AC 3F B5
1289:D0 08 A9 01 8D 94 3F 8D 28
1291:AC 3F CE 8F 3F D0 38 A9 06
1299:02 8D 8F 3F A2 07 BD BE 73
12A1:3F F0 29 BC 6E 3F BD 77 F5
12A9:3F 18 79 8A 11 9D 77 3F 78
12B1:D9 88 11 D0 0D A9 00 9D C0
12B9:BE 3F 8A 0A A8 A9 00 99 84
12C1:01 D0 BD A0 3F 18 7D 77 29
12C9:3F 9D F8 07 CA 10 CF 4C 07
12D1:31 EA A9 00 AA 9D 00 47 91
12D9:E8 D0 FA 8D CE 3F 8D DE 4C
12E1:3D A9 02 8D B6 3F AD 45 7B
12E9:3F 29 01 F0 03 EE C6 3F C7
12F1:AD C6 3F 8D D1 3F A2 10 40
12F9:86 0D CA 86 39 A2 09 8E 5B
1301:AA 3F A9 00 9D 96 3F CA 12
1309:10 FA AE 45 3F AD 44 3F 98
1311:D0 04 E0 05 90 28 A2 09 80
1319:20 52 0B F0 0B A8 B9 D0 93
1321:08 18 7D 58 11 9D 96 3F F1
1329:CA 10 ED AD 1B D4 29 07 D6
1331:AA E8 E8 BD 96 3F 18 69 2B
```

```
1339:20 9D 96 3F D0 20 A2 00 E9
1341:A9 03 85 FC AD 45 3F 38 B6
1349:E9 01 0A 0A 0A A8 B9 38 25
1351:11 AA B9 39 11 9D 96 3F E0
1359:C8 C8 C6 FC 10 F0 A9 00 56
1361:85 05 20 F8 13 A9 06 A8 13
1369:20 21 14 A6 05 BD 96 3F 60
1371:F0 4B DE 96 3F 20 AC 14 10
1379:A9 00 20 42 0F 20 22 0F E8
1381:A5 05 20 8A 15 AD AA 3F 5C
1389:A6 03 9D AE 3F AE AA 3F AB
1391:A9 00 20 D7 14 E6 03 A5 F5
1399:03 C9 08 D0 C8 20 A4 13 E4
13A1:4C 66 13 AD BE 3F D0 FB 55
13A9:A2 07 BD AE 3F F0 07 86 D7
13B1:FE 20 54 14 A6 FE CA 10 02
13B9:F1 20 F8 13 60 E6 05 A5 7F
13C1:05 C9 09 D0 A0 20 A4 13 EC
13C9:A5 11 F0 05 A2 00 20 1D E7
13D1:1B A5 12 F0 05 A2 01 20 15
13D9:1D 1B A9 05 85 FE 20 AC EF
13E1:14 A9 3F 20 22 0F A9 01 08
13E9:20 42 0F C6 FE D0 EF AD C7
13F1:BE 3F D0 FB 4C 5C 19 A9 D0
13F9:00 85 03 A2 07 9D AE 3F 57
1401:CA 10 FA 60 84 0F A9 0C B7
1409:99 00 41 A9 01 20 00 1D 66
1411:A4 0F B9 7F 11 20 00 1D A4
1419:A4 0F A9 0A 99 00 41 60 DC
1421:C0 02 B0 09 A0 00 C9 05 6E
1429:F0 0E C8 D0 0B AC D8 3F 6F
1431:F0 06 AC D9 3F D0 0A C8 A0
1439:99 D8 3F A9 14 99 DA 3F E2
1441:60 A0 00 AD D8 3F C9 06 F9
1449:F0 EE C8 AD D9 3F C9 06 FE
1451:F0 E6 60 AA BD 00 42 85 5A
1459:FC BD 00 4E A8 B9 68 11 62
1461:18 7D 00 40 85 FB BD 00 90
1469:43 10 02 E6 FB BD 00 43 FF
1471:29 04 F0 06 E6 FB E6 FB 9E
1479:E6 FB 86 03 20 94 14 A6 37
1481:03 BD 00 43 10 0C E6 FB 49
1489:20 D2 1A A6 07 A4 08 20 1F
1491:A2 14 60 BD 00 4C 20 F9 63
1499:1A A8 BD 00 4B 20 EE 1A 83
14A1:AA A5 FC 20 42 0F A5 FB BF
14A9:4C 22 0F AD 1B D4 29 1F DA
14B1:85 FC AD 1B D4 29 07 18 B4
14B9:65 FC AA AD 1B D4 29 0F 91
14C1:18 69 02 85 FC AD 1B D4 92
14C9:29 07 18 65 FC A8 20 2B 97
14D1:0F C9 20 D0 D6 60 85 FC 45
14D9:86 FE A2 00 BD BE 3F F0 B1
14E1:12 E8 E0 08 90 F6 AE CE 76
14E9:3F E8 E0 08 90 02 A2 00 5A
14F1:8E CE 3F A9 01 9D BE 3F D2
14F9:A5 FC 9D 6E 3F A8 B9 86 65
1501:11 9D 77 3F 20 52 0B A8 07
1509:B9 64 11 9D A0 3F A4 FE 6F
1511:B9 00 42 9D 27 D0 B9 00 2A
1519:43 30 04 A9 00 F0 09 B9 9B
1521:00 4E A8 85 FD B9 1D 11 6E
1529:18 69 14 85 FC A4 FE B9 C6
1531:00 4B C9 1E B0 0C A9 FF 52
1539:38 FD D4 08 2D 10 D0 4C B1
1541:49 15 BD D4 08 0D 10 D0 BF
1549:8D 10 D0 B9 00 4B 0A 0A 3F
1551:0A 18 65 FC 85 FC 8A 0A 42
1559:A8 A5 FC 99 00 D0 A4 FE 06
1561:B9 00 43 30 04 A9 00 F0 8B
1569:05 A4 FD B9 21 11 18 69 81
1571:2D 85 FC A4 FE B9 00 4C A8
1579:0A 0A 0A 18 65 FC 85 FC 15
1581:8A 0A A8 A5 FC 99 01 D0 04
1589:60 85 04 98 48 8A 48 20 6C
1591:B2 15 A5 04 20 D8 15 68 46
1599:9D 00 4B 68 9D 00 4C 20 28
15A1:52 0B 9D 00 4E AD 1B D4 9F
15A9:29 07 18 69 01 9D 00 4A 8C
15B1:60 A2 10 BD 00 47 F0 16 A7
15B9:E8 D0 F8 A6 39 E8 D0 02 27
15C1:A2 10 86 39 20 94 16 A6 CB
15C9:39 20 7A 1E A6 39 EC AA 68
15D1:3F 90 03 8E AA 3F 60 A0 BC
15D9:40 8C E7 15 A8 B9 6C 11 AB
15E1:A8 B9 FE 15 9D 00 40 C8 36
15E9:EE E7 15 AD E7 15 C9 4A 74
15F1:D0 EF A9 00 9D 00 4D A9 E6
15F9:01 9D 00 4A 60 40 7F 86 3A
1601:38 05 00 00 01 05 04 50 FE
1609:0A 92 21 05 01 00 01 08 65
1611:07 60 7F 73 10 00 03 00 86
1619:02 09 06 70 7F 48 18 00 9D
1621:04 00 03 08 08 80 7F 75 E6
1629:00 00 05 00 03 07 08 90 CA
1631:7F 77 00 00 06 00 04 06 39
1639:09 A0 0E 7E 62 00 00 01 CF
1641:03 08 0A B0 0B 89 0B 00 D1
1649:01 01 02 06 0F C0 0D 34 A0
1651:63 00 05 01 03 14 0F D0 37
1659:0A 02 20 00 00 00 03 02 17
1661:01 E0 FF 00 20 00 00 00 47
1669:01 02 01 E0 FF 00 20 00 05
1671:00 00 01 01 01 E0 FF 00 59
1679:10 00 00 00 10 02 01 F0 29
1681:0A 40 22 02 00 00 01 07 30
1689:0E F0 7F 60 20 02 00 00 F7
1691:01 04 09 A9 20 85 FB 8A 94
1699:48 20 94 14 68 AA BD 00 2F
16A1:43 10 03 4C 89 14 60 86 7C
16A9:FE BD 81 11 AA BD 35 3F FB
16B1:85 FC BD 38 3F 18 79 00 68
16B9:44 9D 38 3F BD 37 3F 18 CB
16C1:79 00 45 9D 37 3F BD 36 95
16C9:3F 18 79 00 46 9D 36 3F 1F
16D1:20 EF 16 A6 FE BC 81 11 36
16D9:B9 35 3F C5 FC F0 0B B4 EA
16E1:11 C8 C0 0A 90 02 A0 09 58
16E9:94 11 20 CD 0E 60 A2 07 C3
16F1:BD 32 3F C9 0A 90 0B 38 EE
16F9:E9 0A 9D 32 3F CA FE 32 C9
1701:3F E8 BD 3A 3F C9 0A 90 2A
1709:0B 38 E9 0A 9D 3A 3F CA C7
1711:FE 3A 3F E8 CA 10 D9 A0 AE
1719:00 A2 00 B9 32 3F D9 46 14
1721:3F 90 0E F0 05 99 46 3F 3E
1729:A2 01 C8 C0 09 D0 EC F0 64
1731:04 E0 01 F0 F0 A0 00 A2 75
1739:00 B9 3A 3F D9 46 3F 90 08
1741:0E F0 05 99 46 3F A2 01 62
1749:C8 C0 09 D0 EC F0 04 E0 4E
1751:01 F0 F0 60 E6 0D A6 0D 26
1759:EC AA 3F 90 07 F0 05 A2 42
1761:0F 86 0D 60 BD 00 47 F0 CD
1769:EB DE 00 4A D0 E6 BD 00 87
1771:48 9D 00 4A A0 03 A9 00 34
1779:99 CA 3F 88 10 FA BD 00 7F
1781:43 10 03 4C DF 1E BD 00 6D
1789:41 10 1C 20 21 1F A6 0D C1
1791:C9 40 90 03 4C E6 18 C9 EE
1799:20 D0 03 4C 04 19 A9 00 09
17A1:9D 00 47 20 94 16 60 20 67
17A9:82 1B A0 03 A6 0D B9 7F 80
17B1:3F C9 20 F0 12 C9 40 B0 ED
17B9:14 C9 3F D0 0A BD 00 42 E2
17C1:29 10 F0 03 20 0C 19 88 C2
17C9:10 E2 4C 47 18 C9 E0 90 F0
17D1:1B BD 00 42 29 20 D0 EF 7C
17D9:20 1A 19 D0 56 BD 00 43 BB
17E1:29 10 F0 4F 20 1A 19 4C A3
17E9:C8 17 F0 47 C9 D0 90 05 8C
17F1:A9 00 99 87 3F BD 00 42 D3
17F9:29 0F D9 87 3F F0 09 AA AE
1801:B9 87 3F DD A4 11 D0 17 D7
1809:A6 0D BD 00 43 29 08 F0 47
1811:B6 98 AA FE 8B 3F 20 43 E4
1819:19 20 43 19 4C C8 17 A6 32
1821:0D BD 00 42 10 03 20 1A 52
1829:19 BD 00 42 29 40 F0 03 A8
1831:20 0C 19 BD 00 43 29 03 D5
1839:85 03 20 52 0B 38 E5 03 1E
1841:99 CA 3F 4C C8 17 A6 0D 9A
1849:BD 00 4E AA A8 FE 8B 3F 64
1851:BE 7B 11 DE 8B 3F 20 43 AC
1859:19 20 43 19 A0 03 84 0E 40
1861:B9 8B 3F 85 FD 88 B9 8B A2
1869:3F C5 FD 90 06 F0 EA 85 C2
1871:FD 84 0E 88 10 F0 A4 0E A7
1879:B9 83 3F C9 01 D0 0B B9 07
1881:7F 3F C9 20 F0 04 C9 3F E6
1889:90 BC A0 03 84 04 C4 0E 41
1891:F0 03 20 2E 19 A4 04 88 CD
1899:10 F2 A5 0E A6 0D DD 00 49
18A1:4E F0 09 9D 00 4E 20 55 FE
18A9:14 4C 2C 19 A4 0E B9 83 62
18B1:3F C9 01 D0 4E B9 7F 3F B8
18B9:C9 3F D0 0F FE 00 4D FE 3B
18C1:00 47 A9 04 A8 20 21 14 55
18C9:4C 04 19 B0 03 4C 47 18 3F
18D1:A6 0D BD 00 42 29 0F D9 FE
18D9:87 3F F0 1F AA B9 87 3F 38
18E1:DD A4 11 F0 16 A6 0D 20 E0
18E9:84 1C 20 A4 1D A6 0D BD 0D
18F1:00 47 F0 24 A6 0A BD 00 2D
18F9:47 F0 08 A6 0D 20 01 1F 7F
1901:4C 55 14 A6 0D 20 F3 1E 8A
1909:4C 2C 19 A9 28 38 F9 83 C3
1911:3F 18 79 8B 3F 99 8B 3F 87
1919:60 A9 28 38 F9 83 3F 85 50
1921:03 B9 8B 3F 38 E5 03 99 A1
1929:8B 3F 60 A4 0E B9 CA 3F 73
1931:30 01 60 20 B2 15 98 A4 89
1939:0D 20 2F 1D A9 06 A8 4C B4
1941:21 14 20 52 0B AA FE 8B BE
1949:3F 60 07 01 0D 05 00 0F AF
1951:16 05 12 10 12 05 13 13 F0
1959:00 06 37 A4 CB C0 06 D0 7C
1961:15 AD 76 3F 49 01 8D 76 2C
1969:3F A5 A2 18 69 0F 85 FC 0A
1971:A5 A2 C5 FC D0 FA AD 76 EB
1979:3F F0 1B A5 A2 29 01 AA AB
1981:98 DD 5F 11 D0 D5 B5 11 CE
1989:F0 D1 FE 84 11 FE 00 42 97
1991:20 55 14 4C 6A 19 AD 94 18
1999:3F F0 08 20 23 1C AD 95 25
19A1:3F D0 40 CE D1 3F D0 12 DB
19A9:AD C6 3F 8D D1 3F A5 A2 9E
19B1:85 FC A5 A2 C5 FC F0 FA C3
19B9:D0 A1 20 55 17 AD 1B D4 90
19C1:D0 1E AD 1B D4 C9 C8 90 3B
19C9:17 AD DE 3D C9 05 B0 10 76
19D1:EE DE 3D 20 AC 14 A9 3F 25
19D9:20 22 0F A9 01 20 42 0F 3D
19E1:4C 5C 19 A9 00 8D 95 3F AF
19E9:A2 01 86 3A A6 3A B5 11 BC
19F1:F0 0B BD 91 3F D0 06 20 99
19F9:1B 1A 20 E1 1C C6 3A 10 E2
1A01:EB AD 00 4D 18 6D 01 4D 31
1A09:C9 05 90 03 4C 97 1E A5 48
1A11:11 D0 90 A5 12 D0 8C 4C A7
1A19:F6 1B BD 00 DC 8D A8 3F F4
1A21:86 05 29 0F 38 E9 05 A8 0C
1A29:B9 2D 11 85 04 30 10 BD BE
1A31:00 4E C5 04 D0 0E BD 00 2C
1A39:43 10 41 20 DF 1E 60 A6 1C
1A41:05 4C 55 14 BD 00 4E A8 2A
1A49:85 06 BD 00 43 30 18 A4 29
1A51:04 20 D5 1A 20 24 1F A6 62
1A59:05 C9 20 F0 17 C9 3F B0 A4
1A61:13 A5 06 85 04 90 15 B9 E7
1A69:7B 11 C5 04 D0 CD 20 D2 69
1A71:1A 20 18 1C A5 04 9D 00 F7
1A79:4E 4C 40 1A 20 21 1F A6 FB
1A81:05 C9 20 F0 47 C9 3F F0 8E
1A89:1E C9 3F 90 39 86 09 20 46
1A91:89 1C C0 02 90 30 C0 10 A0
1A99:B0 0A B9 00 4E A6 3A DD 3F
1AA1:00 4E F0 22 4C A4 1D FE D7
1AA9:00 4D A0 01 A9 04 20 21 14
1AB1:14 BC 00 47 C8 C0 0A 90 81
1AB9:01 88 98 9D 00 47 20 0F E9
1AC1:0F 4C CD 1A D0 06 20 01 CB
1AC9:1F 4C 40 1A A6 05 4C F3 20
1AD1:1E BC 00 4E BD 00 4B 18 C5
1AD9:79 25 11 20 EE 1A 85 07 2A
1AE1:BD 00 4C 18 79 29 11 20 B2
1AE9:F9 1A 85 08 60 10 02 A9 C3
1AF1:26 C9 27 90 02 A9 00 60 B0
1AF9:C9 01 D0 02 A9 18 C9 19 E7
1B01:D0 02 A9 02 60 BD 00 43 B2
1B09:49 80 9D 00 43 BD 00 43 0C
1B11:29 FB 9D 00 43 60 D6 11 E8
1B19:A9 03 95 14 86 05 B5 11 9D
1B21:F0 5C A9 09 20 D8 15 B5 F0
1B29:14 9D 00 47 BD 84 11 9D 05
```

```
1B31:00 42 BD 62 11 9D 00 4B 20
1B39:85 07 A9 17 9D 00 4C 85 A5
1B41:08 BD 7F 11 9D 00 4E A9 1F
1B49:00 20 D7 14 A6 05 A9 28 88
1B51:9D 91 3F 20 24 1F A6 05 94
1B59:C9 20 F0 1D C9 3F D0 05 5E
1B61:FE 00 4D D0 14 86 09 20 BA
1B69:89 1C A6 0A 20 94 16 A6 07
1B71:0A A9 00 9D 00 47 20 7A C8
1B79:1E A4 05 20 05 14 4C CD 69
1B81:0E A9 03 85 FC 86 05 BD AB
1B89:00 49 85 FD 85 02 A0 03 1B
1B91:A9 00 99 83 3F A9 64 99 0B
1B99:8B 3F 88 10 F3 A6 05 BD 79
1BA1:00 4B 85 03 BD 00 4C 85 97
1BA9:FB A4 FC A5 03 18 79 25 91
1BB1:11 20 EE 1A AA 85 03 A5 0F
1BB9:FB 18 79 29 11 20 F9 1A CC
1BC1:A8 85 FB 20 2B 0F A4 FC 0B
1BC9:99 7F 3F 98 AA FE 83 3F B5
1BD1:B9 7F 3F C9 20 D0 04 C6 5C
1BD9:FD D0 CE A4 FB A6 03 20 08
1BE1:4B 0F 29 0F A4 FC 99 87 6B
1BE9:3F C6 FC 30 07 A5 02 85 6C
1BF1:FD 4C 9E 1B 60 A2 08 BD 1B
1BF9:4B 19 F0 08 9D 17 06 A5 B5
1C01:A2 9D 17 DA CA 10 F0 20 1B
1C09:0A 1F F0 03 4C A4 19 A9 2D
1C11:93 20 D2 FF 4C B3 0B A5 62
1C19:07 9D 00 4B A5 08 9D 00 79
1C21:4C 60 A2 02 A9 00 8D 94 09
1C29:3F 86 05 BD 00 47 F0 3A 58
1C31:BD 00 43 10 06 20 DF 1E 40
1C39:4C 6B 1C 20 21 1F A6 05 CF
1C41:C9 20 F0 21 C9 40 B0 0C 53
1C49:20 94 16 A6 05 A9 00 9D 50
1C51:00 47 F0 16 20 94 16 A6 01
1C59:05 20 84 1C 20 A4 1D 20 5C
1C61:73 1C 4C 6B 1C A6 05 20 40
1C69:F3 1E A6 05 E8 E0 10 D0 04
1C71:B8 60 A4 0A B9 00 47 F0 A0
1C79:01 60 A6 05 BD 00 41 AA 8A
1C81:4C A8 16 86 09 20 D2 1A BD
1C89:A0 00 A6 09 84 0A B9 00 37
1C91:47 F0 45 B9 00 4B 85 0B 31
1C99:C5 07 F0 16 B9 00 43 10 5A
1CA1:37 B9 00 4E A8 A5 0B 18 D2
1CA9:79 25 11 20 EE 1A C5 07 7E
1CB1:D0 26 A4 0A B9 00 4C 85 FC
1CB9:0B C5 08 F0 16 B9 00 43 D3
1CC1:10 16 B9 00 4E A8 A5 0B 2A
1CC9:18 79 29 11 20 F9 1A C5 85
1CD1:08 D0 05 E4 0A F0 01 60 A7
1CD9:A4 0A C8 D0 AF 68 68 60 5D
1CE1:AD A8 3F 29 10 F0 01 60 3C
1CE9:A4 3A B9 B7 3F F0 01 60 D5
1CF1:A9 05 20 21 14 A4 3A A9 A7
1CF9:0C 99 B7 3F B9 00 4E 85 79
1D01:FE 84 05 A2 02 BD 00 47 F4
1D09:F0 1C E8 E0 10 D0 F6 AE 4E
1D11:B6 3F 86 FD 20 94 16 AE 55
1D19:B6 3F E8 E0 10 D0 02 A2 14
1D21:02 8E B6 3F A6 FD A5 FE 42
1D29:A4 05 20 2F 1D 60 9D 00 93
1D31:4E B9 00 41 86 05 84 FD 64
1D39:20 D8 15 A4 FD BD 00 42 CF
1D41:29 F0 19 00 42 9D 00 42 3A
1D49:BC 00 4E A6 FD 20 D5 1A 4C
1D51:A6 05 20 18 1C A6 FD BD DA
1D59:00 43 10 08 A6 05 20 D2 43
1D61:1A 20 18 1C A5 FD C9 02 30
1D69:B0 05 A6 05 9D 00 41 20 F1
1D71:24 1F A6 05 C9 20 F0 28 83
1D79:C9 40 B0 06 A9 00 9D 00 A7
1D81:47 60 86 09 20 89 1C 20 58
1D89:A4 1D A6 0A BD 00 47 D0 20
1D91:0F A6 09 BD 00 41 C9 02 94
1D99:B0 E7 AA A4 0A 4C A8 16 AE
1DA1:4C 55 14 A4 0A B9 00 43 9E
1DA9:29 40 F0 28 A6 09 BD 00 FD
1DB1:43 29 20 F0 1F B9 00 4E 19
1DB9:A8 BD 00 4E D9 7B 11 F0 6C
1DC1:13 BC 00 4E B9 7B 11 9D 15
1DC9:00 4E A9 01 A6 09 BC 00 AF
1DD1:41 4C 21 14 A6 0A DE 00 40
1DD9:47 A9 01 20 D7 14 A6 09 A9
1DE1:BD 00 43 29 20 F0 03 DE 9F
1DE9:00 47 BD 00 41 30 20 C9 82
1DF1:02 B0 10 BD 00 47 C9 02 E9
1DF9:90 15 A6 0A A9 00 9D 00 BF
1E01:47 F0 0C BD 00 43 29 20 F9
1E09:F0 05 A9 01 20 D7 14 A0 6D
1E11:03 A6 09 BD 00 41 30 06 E0
1E19:C9 02 90 02 A0 07 84 0B 22
1E21:A6 0A BD 00 47 D0 12 A5 32
1E29:0B C9 07 F0 04 A9 02 85 9D
1E31:0B 20 94 16 A6 0A 20 7A 07
1E39:1E A6 09 BD 00 47 D0 08 F1
1E41:20 94 16 A6 09 20 7A 1E BB
1E49:A6 09 E0 02 B0 0B 20 0F 58
1E51:0F BD 00 47 D0 03 4C 17 3B
1E59:1B A6 0A E0 02 B0 12 20 33
1E61:0F 0F A0 01 A5 0B 20 21 C7
1E69:14 BD 00 47 D0 0A 4C 17 F1
1E71:1B A0 02 A5 0B 20 21 14 2D
1E79:60 BD 00 4D 85 FE A9 00 A5
1E81:9D 00 4D C6 FE 30 F1 20 5F
1E89:AC 14 A9 3F 20 22 0F A9 9B
1E91:01 20 42 0F D0 ED A2 01 14
1E99:86 3A A9 04 AA 20 D8 15 B9
1EA1:A6 3A BD 00 4D F0 0B DE 9A
1EA9:00 4D A0 04 20 A8 16 4C A9
1EB1:A1 1E C6 3A 10 EA AE 45 91
1EB9:3F E8 E0 0A 90 05 A2 00 6A
1EC1:EE 44 3F 8E 45 3F 20 CD 8C
1EC9:0E 20 0A 1F D0 FB 20 0D 0C
1ED1:0E AD 00 47 85 14 AD 01 CD
1ED9:47 85 15 4C D3 12 86 13 89
1EE1:20 94 16 A6 13 20 D2 1A 59
1EE9:20 18 1C 20 06 1B 20 55 F3
1EF1:14 60 86 13 20 06 1B 20 C1
1EF9:55 14 A6 13 20 5A 14 60 DE
1F01:BD 00 43 49 04 9D 00 43 F4
1F09:60 A2 07 BD 54 19 F0 08 CD
1F11:9D C7 05 A9 0A 9D C7 D9 7B
1F19:CA 10 F0 A5 CB C9 03 60 25
1F21:20 D2 1A A6 07 A4 08 20 CC
1F29:2B 0F 60 00 00 00 00 00 CC
```

bug-swatter

Modifications and Corrections

• In the July "BASIC for Beginners" column, the last subroutine listed, lines 4000–4030, has been giving several of our readers trouble. Line 4020 in particular seems to be the culprit. If you have had problems getting the program to work, be sure that you have typed a space between the quotation marks in the IF statement.

• "Easy Full-Screen Animation" (July) has a problem handling very large data files. The problem is caused by the POKE statement in line 480. The program assumes that the value of PA will be less than 32768. If PA is larger than 32767, only a small portion of the data file will be saved to disk. To correct this problem, change line 480 as follows:

```
480 J=INT(PA/256):K=PA-256*J
    :POKE174,K:POKE175,J:SYS62954
```

• The listings of line 1 of "Program Appender" (September) have been switched. The line labeled as the 128 version is the Plus/4, 16 version and vice versa. We regret any confusion this may have caused.

• Several readers have had problems viewing the disk directory from *"SpeedScript 128"* (October). According to one reader, "the directory seems to work sometimes, but most of the time it doesn't." The directory will work correctly every time if you make sure that the 40/80-column key is depressed each time you run *SpeedScript 128*. If you can't look at the disk directory from within *SpeedScript 128*, simply exit the program, press the 40/80-column key, and run it again.

• We inadvertently omitted the "Automatic Proofreader" checksums when listing "GeoConverter" (p. 95) in the October issue. The checksums and corresponding line numbers are listed below. After typing this in, be sure to see "GeoConverter Fix" on p. 52 in this issue.

```
KC 10   KK 110   BK 210   KP 310
AH 20   MD 120   FK 220   KQ 320
SX 30   CR 130   AA 230   MQ 330
HM 40   FB 140   GR 240   QJ 340
DJ 50   JX 150   JS 250   AS 350
FJ 60   HR 160   GJ 260   QC 360
SX 70   MA 170   JR 270   KQ 370
FM 80   QF 180   FJ 280   QE 380
PS 90   GH 190   JM 290   PX 390
HA 100  BR 200   XA 300   BP 400
```

news & products

Yaks, Jets, And Myths

Eurosoft International has announced three software titles for the Commodore 64: *Yak's Progress*, a compilation of eight games from popular British programmer Jeff Minter; *Jump Jet*, a vertical takeoff flight and combat simulator; and the repackaged version of *Valhalla*, an interactive computer movie.

Minter's collection offers arcade-style games with titles including *Revenge of the Mutant Camels*, *Laser Zone*, *Sheep in Space*, and *Metagalactic Llamas*. Most of the games revolve around the attempted domination of earth by forces of Zzyax and Irata, interstellar allies with an array of devious weapons at their disposal.

Jump Jet features the Sea Harrier VTOL (Vertical TakeOff and Landing) fighter plane. Known as a "jump jet" by the pilots who fly it, the Harrier is famous for its VTOL abilities, as well as its capacity to hover and fly backward.

The player selects one of five skill levels, then proceeds to lift off the deck of an aircraft carrier. Using the radar and the range finder within the on-screen instrument panel, the player seeks and destroys enemy aircraft by launching Sidewinder air-to-air missiles. Audible warnings are given to the pilot using Commodore's voice and sound capabilities. Once the enemy has been destroyed, the pilot must relocate the carrier and attempt to land the *Jump Jet* to successfully complete the mission and gain promotion.

Valhalla, winner of the 1984 British Microcomputing Game-of-the-Year Award, uses the MOViSoft animation technique in six adventures to find hidden treasure.

The game takes place within the world of Norse mythology. Players interact with 36 animated characters in pursuit of the lost treasure of *Valhalla*. Depending on their disposition, each mythological character can either help or hinder as you discover your way around *Valhalla's* world of over 81 different locations.

Suggested retail price for *Jump Jet* and *Valhalla* is $24.95; for *Yak's Progress*, $19.95.

Eurosoft International, 114 East Ave., Norwalk, CT 06851

Circle Reader Service Number 201.

Programming Package For *GEOS*

Berkeley Softworks, developers of *GEOS*, has unveiled a full-featured application development software package titled *geoProgrammer* that is targeted for *GEOS* enthusiasts who have a good understanding of 6502 assembly language.

geoProgrammer is comprised of three main components: geoAssembler, geoLinker, and geoDebugger.

geoAssembler reads source text from a geoWrite deocument. A source document may include other geoWrite documents. Supporting standard 6502 assembly language mnemonics and addressing modes, a user can define over 1,000 labels for each assembly module. Expressions can include any combination of arithmetic and logical operators. When graphics need to be defined in a program, the user can simply paste in a picture from geoPaint. Graphics appear as pictures in listings instead of long lists of numbers.

geoLinker accepts link structure from the geoWrite document and reads relocate object modules produced by geoAssembler.

geoDebugger, the program's interactive symbolic debugger, automatically transforms the RAM Expansion Unit into a monitor so applications using maximum available memory can be debugged.

Suggested price for *geoProgrammer* is $69.95.

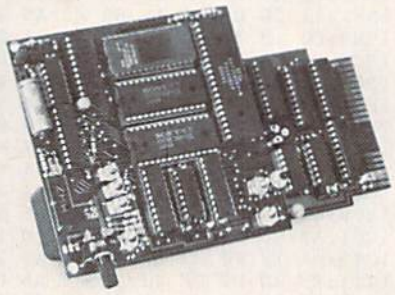
Berkeley Softworks, 2150 Shattuck Ave., Berkeley, CA 94704

Circle Reader Service Number 202.

Speed Up Your 64

Swisscomp has released the Turbo Processor which speeds up Commodore 64 programs such as *Flight Simulator*, *Pocket Writer*, and the majority of spreadsheets, databases, wordprocessors, graphics programs, and many games.

The 4-MHz 16-bit processor card plugs into the expansion (cartridge) port of the 64 and has a 65816 Microprocessor running at 4 MHz. It has 64K of CMOS battery-powered RAM and a 32K EPROM with two operating systems. In one mode it emulates the 64's 6502/6510 microprocessor, allowing full compatibility with a majority of the software for that machine, and in the Turbo Processor mode it can speed-load programs from the 1541 disk drive when used with the optional Turbo Loader cable. In both modes, the processing is sped up by over 400 percent. It can also reduce speed to 100 KHz, which is 1/10 the 64's original speed.



Swisscomp's Turbo Processor

The card has an on-board rechargeable battery, which is automatically trickle-charged when connected to the computer. Programs loaded into the card will remain in RAM even after the switch is turned off and the card is unplugged.

Suggested retail price is $189.95. The optional Turbo Loader cable, which comes with an EPROM that plugs into the 1541, retails for $39.95.

Swisscomp, 5312-56th St., Tampa, FL 33610

Circle Reader Service Number 203.

Five New Titles From Electronic Arts

Electronic Arts has released five new titles for the Commodore 64/128 from three of its affiliated labels.

From DataSoft comes *Video Title Shop* and the accompanying data disk *Video Title Shop Graphics Companion*. Used in conjunction with a video cassette recorder, a video camera, and a Commodore 64 or 128, the program can add enhancements to home video productions, or the user may create a specialized color video production.

The program enables the user to add title screens, borders, and graphics to video productions, and it includes a variety of font styles and sizes, the ability to superimpose text over graphics, scroll, and fade-in and fade-out. The user can use the program to import

Order Any EPYX Program From ComputAbility

And Receive Your Choice

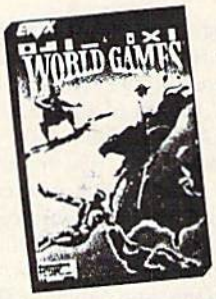
1 - Graphics Scrapbook Or 1 - Programmer's Basic Tool Kit

For

Free

ONLY $24.95 EACH

ONLY $24.95 EACH



ONLY $17.95 EACH

Christmas Hours
Mon-Fri 9am-9pm CST
Sat 11am-5pm
To Order Call Free
800-558-0003
P.O. BOX 17882,MILWAUKEE,WI 53217
ORDER LINES OPEN
No surcharge for MasterCard

SINCE 1982

ComputAbility Consumer Electronics

Christmas Hours
Mon-Fri 9am-9pm CST
Sat 11am-5pm
For Technical Info, Order Inquiries, or for Wisc. Orders
414-357-8181
Telex Number 9102406440
(ANSERBACK = COMPUT MILW UQ)
No surcharge for Visa

graphics from other paint programs.

Video Title Shop Graphics Companion contains a library of ready-made graphics that can be used as is or modified for a specific video production. The program includes 25 pictures applicable for holidays and celebrations such as Christmas, Easter, family vacations, birthdays, and weddings.

Video Title Shop retails for $29.95, and the *Video Title Shop Graphics Companion* sells for $19.95.

DataSoft has also released *Alternate Reality: The Dungeon*, which is the second in the Alternate Reality fantasy role-playing series for the Commodore 64. (The initial offering in the series was *The City*.) *The Dungeon* is one-third larger than its predecessor and includes four levels of dungeons where the user will encounter monsters and other challanges.

The game begins with a character being abducted by a spaceship and taken to a world called Alternate Reality. The user can stay in the other world or return to earth to seek vengence on the abductors. Players can transfer their character from *The City* or begin with a new character. The longer you play, the stronger the character becomes, which helps him defend against enemies.

Alternate Reality: The Dungeon retails for $39.95.

Electronic Arts affiliate, Game Designers Workshop, has released *Road to Moscow* for the Commodore 64, a simulation which allows players to relive the War in Russia between 1941 through 1945.

The program contains five strategy games including 1941 Invasion, 1942 Second Offensive, 1943 Russian Offensives, 1944 Battle of Poland, and a Campaign Game spanning the entire period. In each game, players move or fortify units such as infantry, cavalry, militia, paratroops, and artillery while meeting with the armies of the Germans, Hungarians, Rumanians, Finns, Slovaks, Italians, and Soviets. The object of the game is to take and hold Russian cities before the computer or your opponent accumulates reinforcements. The program contains ten levels of difficulty and random strategic events so no game can be played the same.

Suggested retail price is $39.95.

Strategic Studies Group has released *Battles in Normandy, June-July 1944*, a sequel to *Battlefront*. This strategy game for the Commodore 64 is based on D-day, when the allied forces invaded Normandy. The game recreates the invasion and the battles that followed.

One or two players can relive the scenarios of these battles the way they are set up in the game or they can use the design kit within the program to vary the battles or create entirely new ones. The program also contains an observe mode that allows the user to watch how these battles were actually fought or to test new scenarios that they have created.

Battles in Normandy retails for $39.95.

Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404

Circle Reader Service Number 204.

New Price For *The Toy Shop*

Brøderbund has announced a price reduction for *The Toy Shop*. The new suggested price for the Commodore 64 version is $39.95. The program originally sold for $59.95. *The Toy Shop Refill Kit* has also been reduced from $24.95 to $19.95.

The program is designed to make 20 different working mechanical models. Users can first customize designs, print them out, and then mount them on adhesive cardstock. The parts can then be cut out and assembled. Models include an antique truck, a carousel, and a jet plane.

Brøderbund Software, 17 Paul Dr., San Rafael, CA 94903-2101

Circle Reader Service Number 205.

Music Software

Mastery in Music Software has released six music tutorial programs for the Commodore 64 that offer a unique alternative to drill and practice.

Guitar Master includes sections called Tuning, Chord Analyzer, Progressions, Pick & Strum, Transposing, Scales, and Fret Notes that can aid the student learning to play the guitar.

Other programs available include *Flute Master, Clarinet Master, Saxophone Master, Trumpet Master*, and *Singing Master*. Each can be personalized by your choice of key signature, time signature, tempo, note type and range. Price is $39.95.

Mastery in Music Software, P.O. Box 1027, Bend, OR 97709

Circle Reader Service Number 206.

Napoleon In Russia

KRENtek Software has released *Borodino: 1812 Napoleon in Russia*, a war game that reenacts the battle that decided Napoleon's invasion of Russia and forced his disastrous retreat.

You can be Napoleon, directing your infantry, cavalry, and artillery, while the computer plays the Russians. Try the two-player option in the game that covers the entire three days of battle in the village of Borodino, west of Moscow. Eight historical and what-if scenarios, with optional fatigue and morale options, can be played in a 15–20 minute mode or in versions of 4 or more hours. Available for the Commodore 64, the suggested retail price is $59.95.

KRENtek Software, 5401 N. 10th, Suite 214, McAllen, TX 78504

Circle Reader Service Number 207.

Pick Lottery Numbers

Pure Gold Lotto is the debut market entry of The Rosewater Company's low-cost Pure Gold series. The program aids in picking lottery numbers for U.S. and Canadian lotteries. A key feature is the Numbers Wheeling system, with which Rosewater claims you can increase your chances of winning in a 6/40 lotto game from 1 in 3,838,380 to 1 in 548,340.

Included in the package is a booklet containing the addresses and 24 hotline telephone numbers of all the state lotteries and other information, including taxes on winnings. *Pure Gold Lotto* is available for the Commodore 64 and sells for $19.95.

The Rosewater Company, P.O. Box 32252, Baltimore, MD 21208

Circle Reader Service Number 208.

Three Dimensions For The 64

Digiscape Software has released *3D Surface*, a software package for the Commodore 64 that lets the user graph topographic maps, spatial frequency and distribution, subsurface geology, open-pit mines, building sites, and logos—all in three dimensions.

A printout of a 3D Surface *screen*

The menu-driven program removes hidden lines, and one of its more advanced features allows the user to rotate a 3-D graph through 360 degrees. The graph's viewing angle may be adjusted from 10 degrees to 80 degrees. All graphs may be compressed or expanded, printed, and saved to disk. The price is $39.95.

Digiscape Software, P.O. Box 113058, Carrollton, TX 75011-3058

Circle Reader Service Number 209.

Three Games From Accolade

Accolade has released three new games for the Commodore 64 that test users' skills in putting, driving, and space flight.

Mini-Putt is a minature golf game for one to four players that features cartoon-style animation and four courses.

Christmas Hours
Mon-Fri 9am-9pm CST
Sat 11am-5pm

ComputAbility
Consumer Electronics

Christmas Hours
Mon-Fri 9am-9pm CST
Sat 11am-5pm

THE 64/128 COMPUTER STORE THAT'S AS CLOSE AS YOUR TELEPHONE

NX-10 PRINTER
Star Micronics
ONLY $149

Panasonic Office Automation
1080 i - II
Now at 144 CPS
ONLY $159

Panasonic Office Automation
1091 i - II
Now at 192 CPS
ONLY $179

NEW COMMODORE
128 D
TOO LOW TO ADVERTISE

NEW COMMODORE
1581C
3 1/2" DISK DRIVE
$179

NEW AMIGA 500
TOO LOW TO ADVERTISE
CALL ABOUT USER GROUP PROMOTION

COMMODORE MODEM PACKAGE
AVATEX 1200 HC +
RS 232 Interface
ONLY $139

64C COMPUTER
1541C DISK DRIVE
1802C MONITOR

C-128 COMPUTER
1571 DISK DRIVE
2002 MONITOR

CALL FOR INDIVIDUAL & SUPER PACKAGE PRICES

1750 RAM EXPANDER
1741 RAM EXPANDER
1351 MOUSE

AVATEX 1200 HC MODEM
AVATEX 2400 HC MODEM
I CON TROLLER

CALL FOR CURRENT PRICE

Superbase 128	57.95
Wordwriter 128	42.95
Data Manager 128	42.95
Superscript 128	46.95
SuperPak 2	59.95
Sylvia Porter 128	42.95
Paper Clip 2	51.95
Writers Workshop	44.95

C-128 SOFTWARE

Pocket Filer 2	36.95
Pocket Writer 2	36.95
Basic Compiler 128	39.95
Fontmaster 128	36.95
Visawriter 128	54.95
Multiplan 128	27.95
Geo Dex 128	44.95
Chart Pak 128	25.95
Cad Pak 128	39.95
Super C Compiler	39.95
Cobol 128	39.95
Speed Term 128	25.95
Pocket Planner 2	36.95
GeoCalc 128	44.95
Visastar 128	54.95
Super Pascal 128	39.95
Super Pak 128	46.95
Swiftcalc 128	42.95
Partner 128	42.95
Fleet System 4	46.95
Beyond Zork	29.95
GeoFile 128	44.95

AMIGA SOFTWARE
CALL FOR PRICE & AVAILABILITY

MISCELLANEOUS 64

Accolade's Comics	19.95
Animation Station	59.95
Art Gallery 1 or 2	16.95
Battle Front	26.95
Bureaucracy	22.95
Business Form Shop	25.95
Copy II 64	27.95
Contriver Mouse	36.95
Dark Tower	19.95
Elite	22.95
Final Cartridge 3	49.95
Flight Simulator II	33.95
Fellowship/Ring	23.95
Fontmaster 2	30.95
Hobitt	23.95
Hollywood Hijinks	22.95
Jet	27.95
Leather Goddesses	22.95
Lurking Horror	22.95
Micro League Baseball	25.95
Moonmist	22.95
Pocket Dictionary	10.95
Printmaster	21.95
Sentry	25.95
Starfleet I	26.95
Station Fall	22.95
Starglider	25.95
Sublogic Football	27.95
Sublogic Baseball	33.95
Superscript 64	32.95
Superbase 64	46.95
SuperPak 2	59.95
The Pawn	25.95
Thunder Chopper	19.95
Tracker	25.95
Ultima II	32.95
Up Periscope	19.95
WWF Wrestling	25.95
X-15	19.95
1942	19.95
Oxford Basic Tool Kit	19.95
Night on the Town	19.95
Dark Caste	21.95
Create a BasketBall Team	17.95
Pro FootBall Facts	31.95
Maniac Mansion	22.95
Raids on Raiders	22.95
Star Trek 3/ Rebel Universe	19.95
College Basketball	27.95
Typing Tutor 4	25.95
NBA	25.95
DefCon 5	17.95
Cycle Night	16.95

ACTIVISION

Aliens	22.95
Champ Baseball '86	19.95
Gamemaker	25.95
Gamemaker Library	14.95
GFL Football	22.95
Greet. Card Maker	22.95
Hacker II	22.95
Howard The Duck	22.95
Labyrinth	22.95
Last Ninja	22.95
Portal	25.95
Shanghai	19.95
Tass Times	19.95
Top Fuel Eliminator	19.95
Transformers	19.95
2 on 2 Basketball	22.95
Might & Magic	25.95
Gee Bee Air Rally	19.95
Postcards	17.95
Star Rank Boxing II	19.95

ABACUS 64

Basic Compiler	25.95
Chartpak	25.95
Cad-Pak	25.95
Forth	25.95
Geos Inside & Out	16.95
Powerplan	25.95
Personal Portfolio	25.95
Super C Compiler	39.95
Super Pascal	39.95
Xper System	39.95

ACCESS

Echelon	29.95
Executive Disk	14.95
Famous Courses	14.95
Leader Board	24.95
Mach V-Cart	21.95
Tournament Disk	14.95
Triple Pak	14.95
Wild Class Leader Brd	25.95
World Famous Courses 1 or 2	14.95

COSMI

Grand Slam BB	17.95
Shirley Muldoney	17.95
Chernobel	17.95

BRODERBUND

Bank St. Series(Ea)	32.95
Carmen Sandiego	22.95
Cauldron	19.95
Choplifter+David's Midnight	10.95
Graphic Lib.1,2,or 3	16.95
P.S. Companion	22.95
Print Shop	28.95
Super Bike Challenge	19.95
Thinking Cap	22.95
Toy Shop	32.95
Ultima 1	25.95
Ultima 3	31.95
Ultima 4	38.95
Ultima 5	38.95

MICROPROSE

Airbourne Ranger	22.95
Crusade in Europe	25.95
Conflict in Vietnam	25.95
Decision in the Desert	25.95
F-15 Strike Eagle	22.95
Gunship	22.95
Kennedy Approach	16.95
Pirates	25.95
Silent Service	22.95
Stealth Fighter	25.95
Top Gunner	16.95

MICRO-ILLUSION

Black Jack Academy	24.95
Galactic Invasions	16.95
Fairy Tale Adv	31.95
Firepower	16.95
Lands of Legends	31.95
Planetarium	44.95
Romantic Encounter	24.95
Turbo	16.95

INFOCOM

Plundered Hearts	22.95
Nord And Bert	22.95
Call for items and prices	

KONAMI

Circus Charlie	11.95
Gradius	19.95
Hypersports/Ping Pong	11.95
Iron Horse	19.95
Jail Break	19.95
Jailbreak	11.95
Rushin Attack/Kung Fu	19.95
Super Basketball	19.95
Track & Field	11.95

EPYX

Apshai Trilogy	14.95
BoulderDash Constr Set	17.95
California Games	24.95
Champ Wrestling	24.95
Destroyer	24.95
Fast Load	24.95
Multiplan	27.95
Omnicron Conspiracy	24.95
RAD Warrior	17.95
St. Sports Basketball	24.95
St. Sports Baseball	24.95
Sub Battle Simulat	24.95
Super Cycle	24.95
Summer Games	14.95
Summer Games 2	24.95
Spy US Spy 3	17.95
Vorpal Utility	14.95
World Games	24.95
Winter Games	24.95

CAPCOM

Gunsmoke	19.95
SideArm	19.95
Speed Rumbler	19.95
Trojan	19.95

FIREBIRD

Jewels of Darkness	17.95
Silicon Dreams	17.95
Druid	17.95
Cholo	17.95
Revs +	17.95
Heartland	17.95
Knight ORC	25.95
Golden Pass	25.95
Guild of Thieves	25.95

ACCOLADE

Accolade Comics	24.95
Ace of Aces	18.95
Apollo 18	18.95
Hardball	18.95
Fight Night	18.95
Kill Until Dead	18.95
Mini Putt	18.95
PSI Trading Co.	18.95
Test Drive	18.95

BERKLEY SOFTWORKS

Deskpak I	22.95
Font Pak I	19.95
GeoCable	32.95
Geocalc	34.95
Geochart	27.95
Geodex	25.95
Geofile	32.95
Geo Programmer	49.95
Geopublish	34.95
Geos	37.95
Geospell	19.95
Writer's Workshop	32.95

DATA EAST

Breakthrough	22.95
Commando	22.95
Karate Champ	16.95
Kung Fu Master	16.95
Last Mission	9.95
O'bert	9.95
Speed Buggy	19.95
Tag Team Wrestling	22.95
TNK 3	9.95

ELECTRONIC ARTS

Adv. Construction	10.95
Alternate Reality	20.95
America's Cup	10.95
Amnesia	26.95
Archon	10.95
Archon II	10.95
Arctic Fox	22.95
Autoduel	31.95
Bard's Tale	25.95
Battlefront	25.95
Bismarck	24.95
Carriers At War	31.95
Chessmaster 2000	25.95
Chickamauge	23.95
Dan Dare	14.95
Delta Patrol	14.95
Demon Stalkers	20.95
Dungeon Runners	21.95
EOS	20.95
Europe Ablaze	31.95
Financial Cookbook	10.95
Force 7	14.95
Heart of Africa	10.95
Instant Music	24.95
Lords of Conquest	10.95
Marble Madness	20.95
Mavis Beacon Typing	26.95
Moebius	25.95
Monopoly	26.95
Mail Order Monsters	10.95
Mind Mirror	10.95
Movie Maker	10.95
Mule	10.95
Murder Party	10.95
Music Construction	10.95
Ogre	25.95
One on One	10.95
Outrageous Pages	33.95
Paper Clip III	33.95
Patton vs Rommel	21.95
Pegasus	23.95
Pinball Construction	10.95
Racing Destruction	10.95
Reach for the Stars	30.95
Road to Moscow	25.95
Robot Rascals	25.95
Russia	25.95
Scrabble	22.95
Seven Cities of Gold	10.95
Skate or Die	21.95
Strike Fleet	21.95
Skytox	10.95
Super Boulderdash	10.95
The Dungeon	26.95
Touchdown Football	10.95
Tobruk	23.95
Tomahawk	21.95
Ultimate Wizard	10.95
Video Title Shop	20.95
World Tour Golf	23.95
Yeager AFS	24.95

MINDSCAPE

American Challenge	19.95
Bop 'n Rumble	19.95
Bop 'N' Wrestle	19.95
Crossword Magic	32.95
Defender of the Crown	22.95
Fist	19.95
High Roller	19.95
Indoor Sports	19.95
Into the Eagle's Nest	19.95
Paper Boy	22.95
Parallax	19.95
Perfect Score	44.95
S.D.I.	22.95
Superstar Ice Hockey	22.95
The Gauntlet	22.95
Trailblazer	19.95
Uridium	19.95

SPRINGBOARD

Certificate Maker	30.95
Cert. Maker Lib 1	21.95
Clip Art 1 or 3	18.95
Clip Art 2	21.95
Graphics Expander	21.95
Newsroom	30.95

SSI

B-24	25.95
Battlecruiser	39.95
Eternal Dagger	25.95
Phantasie I,II,or III	25.95
President Elect '88	17.95
Realms/Darkness	25.95
Rings of Zilfin	25.95
Roadwar 2000	25.95
Roadwar Europa	25.95
Shard of Spring	25.95
Shiloh	25.95
War in S. Pacific	39.95
Wargame Construction	20.95
Wizard's Crown	25.95

TIMEWORKS

Business Systems	34.95
Data Manager II	25.95
Desktop Publisher	39.95
Evelyn Wood	19.95
Geos Writer	32.95
Partner 64	39.95
Sideways	19.95
Swiftax' 86	32.95
Swiftcalc/Sideways	25.95
Sylvia Porter	32.95
Wordwriter 3	32.95

SINCE 1982

ComputAbility
Consumer Electronics

P.O. BOX 17882, MILWAUKEE, WI 53217
ORDER LINES OPEN
Mon-Fri 9am-9pm CST Sat 11 am-5 pm CST
To Order Call Toll Free

800-558-0003

For Technical Info, Order Inquiries, or for Wisc. Orders

414-357-8181

Telex Number 9102406446 (Answerback: Comput Milw. UQ)

MasterCard VISA

No surcharge for Mastercard of Visa

ORDERING INFORMATION: Please specify system. For fast delivery send cashier's check or money order. Personal and company checks allow 14 business days to clear. School P.O.'s welcome. C.O.D. charges are $3.00. In Continental USA include $3.00 for software orders 5% shipping for hardware minimum $5.00. MasterCard and Visa orders please include card #, expiration date and signature. WI residents please include 5% sales tax. HI, AK, FPO, APO, Puerto Rico and Canadian orders, please add 6% shipping. Minimum $8.00. All other foreign orders add 15% shipping, minimum $15.00. All order shipped outside the Continental U.S.A are shipped first class insured U.S. mail. If foreign shipping charges exceed the minimum amount, you will be charged the additional amount to get your package to you quickly and safely. All goods are new and include factory warranty. Due to our low prices all sales are final. All defective returns must have a return authorization number. Please call (414)357-8181 to obtain an RA# or your return will not be accepted Prices and availability subject to change without notice.

SOFTWARE DISCOUNTERS OF AMERICA

S.D. of A.

For Orders Only—1-800-225-7638
PA Orders—1-800-223-7784
Customer Service 412-361-5291

- Free shipping on orders over $100 in continental USA
- No Surcharge for VISA/MasterCard
- Your card is not charged until we ship

Commodore 64/128 Bargain Basement—Dozens of Titles For Less Than $10!

Simon&Schuster
COMPUTER SOFTWARE

Design, print, fold & fly award-winning high-performance airplanes.

Great International Paper Airplane Construction Kit
Our Discount Price $9.88

ACCOLADE
Dambusters $9.88
Law of the West $9.88
PSI-5 Trading Co. $9.88

ACTIVISION
Cross Country Road Race $9.88
Ghostbusters $9.88
Hacker $9.88
Little Computer People $9.88
Pitfall/Demon Attack $9.88

ARTWORX
Beach Blanket Volleyball $9.88
Equestrian Show Jumper $9.88
Highland Games $9.88
Hole in One + Six $9.88
Police Cadet $9.88
Thai Boxing $9.88

ARTWORX PX
Cave Fighter $6.88
Galaxy $6.88
Jumpin Jimmy $6.88
Pro Boxing $6.88
Starbase Defense $6.88
Zodiac $6.88

AVANTAGE
Deceptor $9.88
Desert Fox $9.88
Power $9.88
Sigma 7 ..... $9.88
Spy vs. Spy 1 & 2 ..... $9.88

BRODERBUND
Choplifter/David's Midnight Magic $9.88
Karateka $9.88
Loderunner $9.88

CDA
America Cooks Series:
American $9.88
Chinese $9.88
French $9.88
Italian $9.88
Mexican $9.88
World of Wines:
Award Winning Wines $9.88
Bordeaux $9.88
Champagne $9.88

EASY WORKING/ SPINNAKER
Filer $6.88
Planner $6.88
Writer $6.88

ELECTRIC DREAMS
Spindizzy $9.88
Zoids $9.88

ELECTRONIC ARTS
Adventure Const. Set $9.88
Age of Adventure $9.88
America's Cup Sailing $9.88
Archon $9.88
Archon 2: Adept $9.88
Financial Cookbook $9.88
Heart of Africa $9.88
Lords of Conquest $9.88
Mail Order Monsters $9.88
Mind Mirror $9.88
Movie Maker $9.88
M.U.L.E. $9.88
Murder Party $9.88
Music Const. Set $9.88
One-on-One $9.88
Pinball Const. Set $9.88
Racing Dest. Set $9.88
Seven Cities Gold $9.88
Skyfox $9.88
Super Boulder Dash $9.88
Touchdown Football $9.88
Ultimate Wizard $9.88

EPYX
Ballblazer $6.88
Barbie $6.88
Jumpman $6.88

KONAMI/ACTION CITY
Hyper Sports/Ping Pong $9.88
Mikie $9.88
Track & Field $9.88

MASTERTRONIC
Action Biker $6.88
Bounder $6.88
Captain Zap $6.88
Feud $6.88
Games Creator $9.88
Infinity Machine (R) $9.88
Knight Games $6.88
Last V-8 ..... $6.88
Master of Magic $6.88
Ninja $6.88
Pro Golf $6.88
Shogun $6.88
Speed King $6.88
Storm $6.88
Vegas Poker & Jackpot $6.88

*Buy any 3 titles & get Ninja for 99¢! Limited qty.

THUNDER MOUNTAIN

Top Gun™ puts you in the fighter pilots seat of a technologically advanced F-14 Tomcat.

Top Gun™
Our Discount Price $6.88

Simon&Schuster
COMPUTER SOFTWARE

- Personalize & print a Christmas card with your own holiday message.
- Type & print a letter to Santa Claus using the on-screen editor.

'Twas The Night Before Christmas
Our Discount Price $6.88

The Hulk $6.88
Wheel of Fortune $7.88

SIERRA/IMPULSE
BC Quest for Tires $6.88
Frogger $6.88
Mission Asteroid/Wizard & The Princess $6.88
Wiz Math/Wiz Type $6.88

SIMON & SHUSTER
Great Internation Paper Airplane Const. Kit $9.88

SPECTRUM HOLOBYTE
Gato $9.88

SPINNAKER
Alf in the Color Cave $4.88
Bubble Busters $4.88
Cosmic Combat $4.88
Gold Record Race $4.88
Letter Scrambler $4.88
Monster Voyage $4.88
Ranch $4.88
Story Machine $4.88
*all above titles on cart.

TELARIUM
Amazon $9.88
Dragonworld $9.88
Fahrenheit 451 ..... $9.88
Nine Princes in Amber $9.88
Perry Mason: Case of Mandarin Murder $9.88
Rendezvous w/Rama $9.88

THUNDER MOUNTAIN
Cyrus Chess $6.88
Demolition Mission $6.88
Dolphin's Rune $6.88
Eliminator $6.88
Equinox $6.88
Great British Software $6.88
Leviathan $6.88
Maxi Golf $6.88
Mission in Our Solar System $6.88
Paradroid $6.88
Rambo: First Blood Part II $6.88
Show Director $6.88
Slot Car Racer $6.88
Top Gun $6.88

UXB/SPINNAKER
Dark Tower $6.88
Invaders Lost Tomb $6.88
Karate Chop $6.88
Star Trooper $6.88

WINDHAM CLASSICS
Alice in Wonderland $6.88
Below the Root $6.88
Swiss Family Robinson $6.88
Treasure Island $6.88
Wizard of Oz $6.88
*all programs on disk unless otherwise noted!

THUNDER MOUNTAIN

You are John J. Rambo, the toughest jungle fighter Special Forces ever trained.

Rambo® First Blood™ Part II
Our Discount Price $6.88

Gateway to Apshai $6.88
Impossible Mission $6.88
Koronis Rift $6.88
Pitstop 1 or 2 ..... $6.88 Ea.
Rescue on Fractalus $6.88
The Eidolon $6.88

GAMESTAR
Star League Baseball/ On Field Football $9.88

HES
Microsoft Multiplan $9.88

HI-TECH EXPRESSIONS
Award Ware $9.88
Card Ware $6.88
Party Ware $9.88

HI-TECH EXPRESSIONS
Sesame Street Series:
Astro-Grover $6.88
Big Bird's Special Delivery $6.88
Ernie's Big Splash $6.88
Ernie's Magic Shapes $6.88
Grover's Animal Adv. $6.88
Pals Around Town $6.88

KONAMI/ACTION CITY
Circus Charlie $9.88

MASTERTRONIC
2 for 1 series:
BMX Trials/1985 The Day After $4.88
Bump Set Spike!/ Olympic Skier $4.88
Excaliba/Big Mac $4.88
Ice Palace/Hopto $4.88

MINDSCAPE
Bank St. Music Writer $9.88

SEGA
Congo Bongo (R) $6.88
Super Zaxxon (R) $6.88

SSI
Computer Baseball $9.88
Computer Quarterback $9.88
Fifty Mission Crush $9.88
Gemstone Warrior $9.88
Germany 1985 ..... $9.88
Ringside Seat $9.88
Six-Gun Shootout $9.88
Wings of War $9.88

SHARE DATA
Family Feud $7.88
Jeopardy $7.88
Spiderman $6.88

WINDHAM CLASSICS

A Classic Software Fantasy based on the book by L. Frank Baum.

The Wizard of Oz
Our Discount Price $6.88

P.O. BOX 111327—DEPT. CG—BLAWNOX, PA 15238

*Please Read The Following Ordering Terms & Conditions Carefully Before Placing Your Order: Orders with cashiers check or money order shipped immediately on in stock items. Personal & Company checks, allow 3 weeks clearance. No C.O.D.'s! Shipping: Continental U.S.A.—Orders under $100 add $3; free shipping on orders over $100. AK, HI, FPO, APO—add $5 on all orders. Canada & Puerto Rico—add $10 on all orders. Sorry, no other International orders accepted! PA residents add 6% sales tax on the total amount of order including shipping charges! REASONS FOR CALLING CUSTOMER SERVICE—412-361-5291 (1) Status of order or back order (2) If any merchandise purchased within 60 days from S.D. of A. is defective, please call for a return authorization number. Defective merchandise will be replaced with the same merchandise only. Other returns subject to a 15% restocking charge. After 60 days please refer to the manufacturers warranty included with the merchandise & return directly to the manufacturer. Customer service will not accept collect calls or calls on S.D. OF A.'s 800# order lines! Have you seen our on line catalog of 1000 software titles for Commodore, Atari, Apple, IBM and Amiga! It's on Compuserve's Electronic Mall—just type GO SDA and shopping for software will never be the same again! HOURS: Mon.-Fri. 9AM-5:30 PM, Sat. 10AM-4PM Eastern Time. Because this ad had to be written 2-3 mos. before it was published, prices & availability are subject to change! New titles are arriving daily! Please call for more information! Holiday Hours: Nov. 2-Dec. 17; Mon.-Thurs. 9 AM-8 PM, Fri. 9 AM-5:30 PM, Sat. 10 AM-4 PM Eastern Time.

SOFTWARE DISCOUNTERS OF AMERICA

For Orders Only—1-800-225-7638
PA Orders—1-800-223-7784
Customer Service 412-361-5291

- **Free shipping on orders over $100 in continental USA**
- **No Surcharge for VISA/MasterCard**
- **Your card is not charged until we ship**

ABACUS BOOKS
Anatomy of the 1541 ..$14
Anatomy of the C64 ..$14
C128 Basic 7.0 Internals ..$19
C128 Basic Training Guide ..$12
C128 Internals ..$14
C128 Peeks & Pokes ..$12
C128 Tricks & Tips ..$14
CPM on the C128 ..$14
1571 Internals ..$14
GEOS Inside & Out ..$14
GEOS Tricks & Tips ..$14

ABACUS SOFTWARE
Assembler Monitor ..$25
Basic ..$25
Basic 128 ..$39
Cad Pak ..$25
Cad Pak 128 ..$39
Chart Pak ..$25
Chart Pak 128 ..$25
Cobol ..$25
Cobol 128 ..$25
Forth ..$25
Power Plan ..$25
PPM ..$25
PPM 128 ..$39
Speed Term 64 or 128 ..$25
Super C ..$39
Super C 128 ..$39
Super Pascal ..$39
Super Pascal 128 ..$39
TAS ..$25
TAS 128 ..$39

ACCESS
Echelon w/Lip Stik ..$29
Famous Course Disk #1 for World Class L.B. ..$14
Famous Course Disk #2 for World Class L.B. ..$14
Famous Course Disk #3 for World Class L.B. ..$14
Lip Stik Plus ..$19
Mach 5 (R) ..$23
Mach 128 (R) ..$32
Robotics Workshop ..$109
Tenth Frame ..$25
Triple Pack: BH1, BH2, Raid Over Moscow ..$14
World Class Leader Board ..$25

ACCOLADE
Ace of Aces ..$19
Apollo 18: Mission to the Moon ..$19
Comics ..$19
Fight Night ..$19
Hardball ..$19
Killed Until Dead ..$19
Mini Putt ..$19
Test Drive ..$19

ACTION SOFT
Thunder Chopper ..$19
Up Periscope! ..$19

ACTIVISION
Aliens ..$23
Gamemaker w/Sports & Science Fiction Disks ..$33
Gee Bee Air Rally ..$19
Hacker 2 ..$23
Labyrinth ..$19
Maniac Mansion ..$23
Might & Magic ..$25
Music Studio ..$23
Portal ..$25
Postcards ..$19
Shanghai ..$19
Tass Times ..$19
The Last Ninja ..$23
Transformers ..$19

AMERICAN EDUCATIONAL
Biology ..$12
Grammar ..$12
Science: Grades 3/4 ..$12
Science: Grades 5/6 ..$12
Science: Grades 7/8 ..$12
US Geography ..$12
US History ..$12
World Geography ..$12
World History ..$12

ARTWORX
Bridge 5.0 ..$19
Cycle Knight ..$14
International Hockey ..$16
Linkword French 1 or 2 ..$16
Linkword German ..$16
Linkword Russian ..$16
Linkword Spanish ..$16
Strip Poker ..$21
Data Disk #1 Female ..$14
Data Disk #2 Male ..$14
Data Disk #3 Female ..$14
*Buy Compubridge for $9.88 w/purchase of Bridge 5.0!

AVALON HILL
NBA Basketball ..$25
Spitfire '40 ..$23
Super Sunday ..$21
SBS 1985 Team Disk ..$14
SBS 1986 Team Disk ..$14
SBS Gen Mgr Disk ..$19

BAUDVILLE
Blazing Paddles ..$23
Video Vegas ..$19

BERKELEY SOFTWORKS
Geos 128 ..$44
Geos 64 ..$39
Geo Mouse ..Call
Writer's Workshop 128 ..$44
*Geo-Calc ..$33
*Geos Desk Pak 1 ..$23
*Geo-Dex ..$25
*Geo-File ..$33
*Geo-Programmer ..$44
*Geo-Publish ..$44
*Geos Font Pak ..$19
*Writer's Workshop ..$33
*Geos 64 add-on programs only!

BETTER WORKING
Business Form Shop ..$25

BRODERBUND
Carmen Sandiego: USA ..$25
Carmen Sandiego: World ..$23
Cauldron 1 & 2 ..$19
Print Shop ..$26
P.S. Companion ..$23
P.S. Graphics Library #1, #2, or #3 ..$16 Ea.
P.S. Graphics Library Holiday Edition ..$16
P.S. Paper Pack ..$14
Super Bike Challenge ..$14
Toy Shop ..$26
Toy Shop Refill ..$19

CAPCOM
Ghosts & Goblins ..$19
1942 ..$19

CBS
Success w/Algebra: Binomial Multiplication & Factoring ..$19
First Degree & Advanced Linear Equations ..$19
Graphing Linear Functions ..$19
Simultaneous & Quadratic Equations ..$19
Success w/Math: Addition & Subtraction ..$19
Decimals: Add. & Subt. ..$19
Decimals: Mult. & Div. ..$19
Fractions: Add. & Subt. ..$19
Fractions: Mult. & Div. ..$19
Multiplication & Division ..$19

CMS
Gen. Acct. 128 ..$119
Inventory 128 ..$49

DATA EAST
Breakthru ..$19
Commando ..$14
Ikari Warriors ..$19
Tag Team Wrestling ..$23

DATASOFT
Alternate Reality: Dungeon ..$26
221 B. Baker St. ..$21
Theatre Europe ..$19
Tomahawk ..$21
Video Title Shop ..$21

DAVIDSON
Algeblaster ..$32
Math Blaster ..$32
Speed Reader 2 ..$32
Spell It ..$32
Word Attack ..$32

DESIGNWARE
Body Transparent ..$19
European Nations ..$19
Mission Algebra ..$19
Spellicopter ..$19
States & Traits ..$19

DIGITAL SOLUTIONS
Pocket Filer 2 ..$33
Pocket Planner 2 ..$33
Pocket Writer 2 ..$33
*all 3 in 1 Super Pack ..$69

ELECTRIC DREAMS
Rocky Horror Show ..$14
Titanic Recovery Mission ..$14

ELECTRONIC ARTS
Amnesia ..$26
Arctic Fox ..$23
Bard's Tale 1 or 2 ..$26 Ea.
Bard's Tale 1 or 2 Hints ..$9 Ea.
Carriers at War ..$32
Chessmaster 2000 ..$26
Chuck Yaeger's AFS ..$23
Dan Dare ..$14
Delta Patrol ..$14
Dragons Lair ..Call
Dungeon Runners ..$19
Earth Orbit Station ..$21
Instant Music ..$21
Legacy of Ancients ..$21
Marble Madness ..$21
Monopoly ..Call
Patton vs. Rommel ..$21
Pegasus ..$21
Road to Moscow ..$26
Sanxion ..$14
Scrabble ..$23
Skate or Die ..Call
Star Fleet 1 ..$26
Strike Fleet ..$21
World Tour Golf ..$21

ENLIGHTENMENT
Guide to Chess Openings ..$39
Paul Whitehead Teaches Chess ..$39

EPYX
Boulder Dash Construction Kit ..$16
California Games ..$23
Champ. Wrestling ..$23
Create A Calendar ..$19
Destroyer ..$23
Fast Load (R) ..$19.95
Movie Monster ..$14
P.S. Graphics Scrapbook #1: Sports ..$16
#2: Off the Wall ..$16
#3: School ..$16
Rad Warrior ..$16
Spy vs Spy 3: Arctic Antics ..$16
Street Sports: Baseball ..$23
Basketball ..$23
Sub Battle Simulator ..$23
Summer Games ..$14
Summer Games 2 ..$23
Super Cycle ..$14
Temple Apshai Trilogy ..$14
Winter Games ..$23
World Games ..$23

FIREBIRD
Elite ..$19
Golden Path ..Call
Guild of Thieves ..$25
Knight Orc ..Call
Starglider ..$25
The Pawn ..$25
The Sentry ..$25
Tracker ..$25

GAMESTAR
Champ. Baseball ..$19
Champ. Basketball ..$23
GFL Ch. Football ..$23
On-Court Tennis ..$19
Star Rank Boxing 2 ..$19
Top Fuel Eliminator ..$19

HAYDEN
SAT Math ..$14
SAT Verbal ..$14

INFOCOM
Beyond Zork 128 ..$29
Bureaucracy 128 ..$23
Hitchhiker's Guide ..$19
Hollywood Hijinx ..$23
Leather Goddesses ..$23
Nord & Bert Couldn't Make Head or Tail of It ..$23
Plundered Hearts ..$23
Stationfall ..$23
The Lurking Horror ..$23
Trinity 128 ..$23
Zork 1 ..$23
Zork Trilogy ..$39

KONAMI/ACTION CITY
Gradius ..$19
Rush 'n Attack/Yie Ar Kung Fu ..$19
Yie Ar Kung Fu 2 ..$19

MICROLEAGUE
Baseball ..$25
Box Score Stats ..$16
General Manager ..$19
1986 Team Data Disk ..$14
WWF Wrestling ..$25

MICROPROSE
Acrojet ..$16
Airborne Ranger ..$23
F-15 Strike Eagle ..$23
Gunship ..$23
Kennedy Approach ..$16
Pirates ..$25
Project Stealth Fighter ..Call
Silent Service ..$23
Top Gunner ..$16

MINDSCAPE
Bop & Rumble ..$19
Bop & Wrestle ..$19
Defender of the Crown ..$23
Gauntlet ..$23
High Roller ..$19
Indoor Sports ..$19
Infiltrator ..$19
Infiltrator 2 ..$23
Into the Eagle's Nest ..$19
Paperboy ..$23
Perfect Score SAT ..$44
S.D.I. ..$23
Super Star Ice Hockey ..$23
Super Star Soccer ..$23
Uchi Mata Judo ..$19

MISC
Bob's Term Pro ..$29
Bob's Term Pro 128 ..$39
C.P. Copy 2 ..$21
Doodle ..$25
Font Master 2 ..$29
Font Master 128 ..$35
Super Snapshot (R) ..$43
Superbase 64 ..$39
Superbase 128 ..$44
Superscript 64 ..$29
Superscript 128 ..$39

ORIGIN
Autoduel ..$32
Moebius ..$25
Ogre ..$19
Ultima 1 or 3 ..$25 Ea.
Ultima 4 ..$39

PARAGON
Master Ninja ..Call

PERSONAL CHOICE
I am the C128 ..$23
I am the C64 ..$19
Term Paper Writer 128 ..$25

PROFESSIONAL
Fleet System 2 Plus ..$39
Fleet System 4 128 ..$47

RELEVANT
Billboard Maker ..$23
Icon Factory ..$23
Photo Finish ..$19

SIMON & SCHUSTER
Chem. Lab ..$25
JK Lasser Money Mgr ..$25
Star Trek: Promethean Prophecy ..$19
Typing Tutor 3 ..$19

SIR-TECH
Deep Space ..$25

SOFTWARE SIMULATIONS
Football ..$19
Pure Stat Baseball ..$25

SPRINGBOARD
Certificate Maker ..$25
C.M. Library Vol. 1 ..$19
Newsroom ..$32
N.R. Clip Art Vol. 1 ..$19
N.R. Clip Art Vol. 2 ..$25
N.R. Clip Art Vol. 3 ..$19
P.S. Graphics Expander ..$23

SSI
Battle of Antietam ..$32
Battle Cruiser ..$37
Battle Group ..$37
B-24 ..$23
Colonial Conquest ..$25
Eternal Dagger ..$25
Gettysburg ..$37
Kampfgruppe ..$37
Phantasie 1, 2 or 3 ..$25 ea.
President Elect 1988 ..$16
Realms of Darkness ..$25
Rings of Zilfin ..$25
Roadwar 2000 ..$25
Roadwar Europa ..$25
Shard of Spring ..$25
Shiloh ..$25
USAAF ..$37
War Game Const. Set ..$19
War in S. Pacific ..$37
Warship ..$37
Wizard's Crown ..$25

SUBLOGIC
Flight Simulator 2 ..$32
F.S. Scenery Disks ..Call
Jet ..$26

TIMEWORKS
Accts. Payable ..$33
Accts. Receivable ..$33
*Data Manager 2 ..$19
Data Manager 128 ..$33
General Ledger ..$33
Inventory Mgmt ..$33
Partner 64 (R) ..$33
Partner 128 (R) ..$39
*Swiftcalc/Sideways(D) ..$19
Swiftcalc/Sideways 128 ..$33
Sylvia Porter's Personal Fin. Planner 64 ..$33
Sylvia Porter's Personal Fin. Planner 128 ..$39
*Word Writer 3 ..$33
Word Writer 128 ..$33
*All 3 titles in one Pk. ..$59

UNICORN
Decimal Dungeon ..$19
Fraction Action ..$19
Percentage Panic ..$19
Race Car Rithmetic ..$19
Ten Little Robots ..$19

UNISON WORLD
Art Gallery 1 or 2 ..$16 ea.
Print Master Plus ..$23

WEEKLY READER
Stickybear Series: ABC's ..$16
Math 1 or 2 ..$16 Ea.
Numbers ..$16
Reading ..$16
Reading Comp ..$16
Shapes ..$16
Spellgrabber ..$16

ACCESSORIES
Animation Station ..$49
Bonus SS, DD ..$4.99 Bx
Bonus DS, DD ..$5.99 Bx
Compuserve Starter Kit (a $25 usage Credit) ..$19
Disk Case (Holds 75) ..$6.88
Disk Drive Cleaner ..$6.88
Epyx 500XJ Joystick ..$14
Icontroller ..$14
Messenger Modem ..$33
Panasonic Printers ..Call
Suncom Joysticks ..Call
Wico Bat Handle ..$17
Wico Boss ..$12
Wico Three-Way ..$19.95
XETEC Super Graphix ..$59
XETEC Super Graphix Jr. ..$39
*all programs on disk unless otherwise noted!

P.O. BOX 111327—DEPT. CG—BLAWNOX, PA 15238

*Please Read The Following Ordering Terms & Conditions Carefully Before Placing Your Order: Orders with cashiers check or money order shipped immediately on in stock items. Personal & Company checks, allow 3 weeks clearance. No C.O.D.'s! Shipping: Continental U.S.A.—Orders under $100 add $3; free shipping on orders over $100. AK, HI, FPO, APO—add $5 on all orders. Canada & Puerto Rico—add $10 on all orders. Sorry, no other International orders accepted! PA residents add 6% sales tax on the total amount of order including shipping charges! REASONS FOR CALLING CUSTOMER SERVICE—412-361-5291 (1) Status of order or back order (2) If any merchandise purchased within 60 days from S.D. of A. is defective, please call for a return authorization number. Defective merchandise will be replaced with the same merchandise only. Other returns subject to a 15% restocking charge. After 60 days please refer to the manufacturers warranty included with the merchandise & return directly to the manufacturer. Customer service will not accept collect calls or calls on S.D. OF A.'s 800# order lines! Have you seen our on line catalog of 1000 software titles for Commodore, Atari, Apple, IBM and Amiga? It's on Compuserve's Electronic Mall—just type GO SDA and shopping for software will never be the same again! HOURS: Mon.-Fri. 9 AM-5:30 PM, Sat. 10 AM-4 PM Eastern Time. Because this ad had to be written 2-3 mos. before it was published, prices & availability are subject to change! New titles are arriving daily! Please call for more information! Holiday Hours: Nov. 2-Dec. 17; Mon.-Thurs. 9 AM-8 PM, Fri. 9 AM-5:30 PM, Sat. 10 AM-4 PM Eastern Time.

Each course represents a theme drawn from such sources as famous movies, countries, sports, and video and arcade sequences.

The main play screen includes the golfer window, which features the golfer in several animated positions, and a power bar, which is used to select the force and angle of each shot. The overview window displays a top view of the layout of the entire hole, allowing the player to see the placement of obstacles and the position of the tee and hole. Each hole is divided into play-screen windows, which are close-up views of the particular section that the player's ball is in.

The program features three types of obstacles: paths, requiring precise aim; setbacks, consisting of objects that interfere with the path of the ball; and timing, which requires the player to take the shot at a precise moment, such as through a windmill.

The game is completely joystick controlled and retails for $29.95.

In *Test Drive*, players test drive their choice of a Ferrari Testarosa, Lamborghini Countach, Lotus Esprit Turbo, and several other sports cars. Each car's specifications is adjusted according to the vehicle's capabilities.

This driving simulation game displays the interior of the car and the road from the vantage point of the driver. The player will see an actual rendition of the car's dashboard with an inset for the gearshift knob. The remainder of the screen displays the driver's view through the windshield and the road to be challenged. A radar detector and a rear-view mirror are also depicted.

The object of the game is to drive different sections of highway within a certain time limit. Along the way, the player will encounter slower vehicles, oncoming traffic, falling rocks, and the highway patrol, who will appear in the rear-view mirror with his lights flashing if the player is caught speeding. The game ends prematurely when the driver is pulled over by the highway patrol, goes off the road, or arrives at his or her destination too slowly. The player's final score is based on total driving time and is compared to the best score recorded by the designers of this program.

The game retails for $29.95. An Amiga version is available at a suggested retail price of $44.95.

The third release from Accolade is *Apollo 18: Mission to the Moon*, which allows users to recreate any one of the original moon missions of the 1960s. Program graphics are based on actual footage of the Apollo missions.

Players can assume the role of either a mission control specialist or an astronaut. In either role, the player must perform tasks from prelaunch to splashdown in order to complete the mission. The game consists of stages including launch, flight to the moon, orbiting the moon, docking, landing and walking on the moon surface, lunar blastoff, redocking, return route, spacewalking, reentry, and splashdown and recovery.

The player can score points in each stage of the game by performing tasks. A minimum score is required for each task in order to progress to the next stage. Digitized voice and sound are featured throughout the game.

Apollo 18 has a suggested retail price of $29.95.

Accolade, 20813 Stevens Creek Blvd., Cupertino, CA 95014

Circle Reader Service Number 210.

3-D Space Flight Simulator

Echelon is a 3-D space flight simulator for the Commodore 64 released by Access Software. Echelon is the name of a top secret military facility where you will be taught to operate the 21st Century's most awesome combat and exploration vehicle, the Lockheed C-104 Tomahawk.

You will be trained to operate the C-104's advanced instrumentation and weaponry on a series of simulators. When you are ready, you will be assigned to an action-packed patrol zone, where you must find the solution to a series of puzzling and mysterious events. The *Echelon* package includes the LipStik, a voice-activated control headset used for operating various controls aboard the spacecraft. Suggested retail price is $44.95.

Access Software, 2561 S. 1560 West, Woods Cross, UT 84087

Circle Reader Service Number 211.

New From Free Spirit

Free Spirit Software has announced several new software titles for the Commodore 64.

The Communicator is a full-featured, menu-selected terminal program written in assembly language for fast, efficient operation. Communication parameters, which may be user defined or selected, include baud rate (50–1800,) word length, stop bits, parity, and duplex.

The Communicator supports an 18K buffer with full printer, disk, modem, and status line support. Disk files may be sent with or without X-modem protocols. Other features include macro key options, video attribute options, file conversion options, autodial, alarm clock/timer, and DOS command menus.

It can be ordered by mail for $39.95 (shipping and handling included).

Masterpieces I, Flags of the World is the first of a series of detailed hi-res drawings of famous objects and works of art, which can be viewed on a monitor or printed on a Commodore 1525 compatible or color printer. *Flags of the World* contains the flags of 180 countries and is available for $9.95.

English and Scottish Songs is a collection of 16th- and 17th-century English and Scottish folk songs. The historical background of each song is presented, and then the words are displayed on the screen as the music plays. *My Heart's in the Highlands, British Grenadier*, and *Barbara Allen* are among the selections. It sells for $9.95.

Best of Scott Joplin, Volume II is the tenth in a series of classical music disks for the 64 by musician Lorne Strider. A biography of Joplin appears on the screen as the music plays. The price is $9.95.

Circle Reader Service Number 212.

Free Spirit Software, 538 S. Edgewood, LaGrange, IL 60525

QuantumLink Moves Offices

QuantumLink, the Commodore-specific online information service has moved to larger offices in Vienna, VA. The new location is nearly double the size of its previous home. Company staff has increased by 200 percent since QuantumLink's inception two years ago, making the move necessary.

QuantumLink serves its customers with round-the-clock, toll-free telephone numbers, a monthly digest of activities, guided online tours, and other support services.

QuantumLink, 8619 Westwood Center Dr., Vienna, VA 22180

Circle Reader Service Number 213.

Ready-To-Use *GEOS* Graphics

Those Designers has announced additional *Diskart* graphics for use with *GEOS*. The four new disks *(Diskart 5, 6, 7,* and *Musi-Kit)* contain a variety of clip art and illustrations, and they can also provide you with a professional-looking sheet-music tool. These hi-res graphics can be pasted directly into *geoPaint* and *geoWrite* documents, and all are compatible with *GEOS 128*. Each *Diskart* disk retails for $8.50.

Those Designers, 3330 Lewis Ave., Signal Hill, CA 90807

Circle Reader Service Number 214.

Five New Titles From IntelliCreations

DataSoft's IntelliCreations has released five new games for the Commodore 64.

Tomahawk is a helicopter simulation game in which the player pilots a U.S. Army Apache helicopter. Apaches are designed to fly at speeds in excess of 200 mph and are equipped with the latest in high-tech weaponry. Players can select combat or training missions at

four pilot-rating levels. Features include offensive and defensive flight maneuvers, ground attack and air-to-air interception, day and night vision systems, and instruments-only flying.

Suggested retail price is $34.95.

In *Force 7*, the player is the commander of a special forces unit sent to the planet Karis to rescue humans at an energy fabrication plant that has been overrun by aliens. Only one crew member can be teleported to the planet surface at a time to fight the aliens, because only one space suit has survived the journey.

The action/adventure game retails at $19.95.

IntelliCreations has expanded its war strategy game series with *Bismark—The North Sea Chase*, a battleship simulation in which the player can choose to command the Royal Navy or the German battleship that sunk the H.M.S. Hood in 1941. Players can use conventional battleship weapons or use a Fairey Swordfish torpedo plane via a cockpit flight simulator.

Suggested retail price is $34.95.

Another war strategy game, *Tobruk—the Clash of Armour*, is a tank simulation that allows the player to assume the role of Rommel, head of the German Afrika Korps. The game reflects Rommel's attempt to defeat the British in North Africa and move into Egypt, destroying the Allies' hold on the southern Mediterranean.

The game retails for $34.95.

Dark Lord is an introductory graphics/text adventure game in which the player goes into the Alterworld, where an evil wizard must be destroyed. The program contains 80 screens of graphics, animation, music, a self-running demo, and a random relocation of objects.

Suggested retail price is $19.95.

DataSoft, 19808 Nordhoff Pl., Chatsworth, CA 91311

Circle Reader Service Number 215.

Expanding Desktop Publishing

Commodore users can expand their system's desktop publishing capabilities with a new software package from Berkeley Softworks titled *geoPublish*. The software works in conjunction with the *GEOS (Graphic Environment Operating System)* program. With this program, users can create multiple page, multiple column documents (such as newsletters), mixing text columns, graphics images and line graphics on each page.

Users can create a customized master page that contains graphics and text to appear on each page of a document. Master-page definitions can also be loaded from a library or saved for later use.

To design the layout, the user defines rectangular regions on each page of a document. Text flows into columns, automatically continuing onto later pages as necessary. The text retains all information from the source geoWrite document, including font style and size, tabs, centering, and justification. When the text is edited, it automatically reflows back into columns. During or after this process, graphics or photos can be pasted onto each page and cropped, centered, or scaled to fit. If graphics images overlap text regions, text automatically reflows around the graphics.

The onscreen ruler and guidelines help the user modify the layout. An onscreen tool box allows users to choose the graphics tools needed to draw lines, rectangles, and circles in various widths and patterns.

Before the finished product is printed, the user can preview all pages on the screen and focus on any particular area of the page for viewing the actual size of graphics and text. The finished product can be printed on any *GEOS*-compatible printer.

geoPublish retails for $69.95.

Berkeley Softworks, 2150 Shattuck Ave., Berkeley, CA 94704

Circle Reader Service Number 216.

Artworx Releases *CYCLEKNIGHT*

In *CYCLEKNIGHT*, a new game release for the Commodore 64 from Artworx, you drive a hi-tech motorcycle that carries you into a forgotten land of make-believe. Armed with deadly weapons, you journey through 2000 chambers of a dark medieval castle in search of your kidnapped queen and her loyal villagers.

Rev engines one-on-one with the infamous Blacknight, and try your hand at bartering with strange creatures in this program that combines animation and action with strategy, fantasy, and adventure. Suggested retail price for *CYCLEKNIGHT* is $19.95.

Artworx Software, 1844 Penfield Rd., Penfield, NY 14526

Circle Reader Service Number 217.

A Handle For Your 128

Solomon Software Systems has announced *Handle 128* for the Commodore 128. Its menu selections provide one-keystroke access to utilities. The Terminal Setup Menu allows the user to display and set the time, choose the console color scheme, and select some terminal parameters. The program's Sequential File Utility Menu provides the user with the ability to rename, copy, and append sequential files. The user can also verify the BAM, format one or two sides, and collect a disk. The Sequential File Transfer Menu allows selection of input and output devices for creating or transferring files.

Suggested retail price is $19.95.

Solomon Software Systems, 24285 Sunnymead Blvd. #256, Moreno Valley, CA 92388

Circle Reader Service Number 218.

Mindscape Announces *Wordmaze*

Mindscape's Educational Division has introduced *Wordmaze*, a word puzzle program for students from grades 3–12. The program is designed to help develop vocabulary and spelling skills as students search for words hidden in a block of scrambled letters.

The program takes words from eight lists covering topics from space to sports, or from user-supplied lists, and randomly places them in a matrix or maze of letters. The words are placed in any of eight directions and may overlap with other words, sharing some of the same letters. Students may search for words on the computer monitor or from a print-out. *Wordmaze* for the Commodore 64 comes with a teacher's guide and activity sheets for $49.95.

Mindscape, 3444 Dundee Rd., Northbrook, IL 60062

Circle Reader Service Number 219.

Keyboard-Mounted Joystick For *GEOS*

Suncom has released a different input method for Commodore 64s and 128s using *GEOS*. The IconTroller can be used in place of a mouse or a full-sized joystick. The product mounts directly on the keyboard surface with the use of semipermanent, double-faced tape, which is included in the package. A feed-through jack on the accessory allows the user to attach a game-duty joystick or a mouse while the IconTroller is installed and in use.

The IconTroller retails for $19.99.

Suncom, 260 Holbrook Dr., Wheeling, IL 60090

Circle Reader Service Number 220.

Crazy Clip Art

Postcards, recently released from Activision, is a collection of comical clip art, backgrounds, and captions. The program can be used to make postcards, invitations, office notes, momentos, and personalized messages. The clip art includes creatures such as warthogs, dogs, platypuses, cats, rhinos, and rats; people, including Honest Abe and Mona Lisa; signs; foods; aliens; and spacemen. There is also a library of backdrops such as a landscape, a beachscape, and a moonscape. The clip art can be dropped on top of a background, and messages can be added by

using phrases and letters included in the clip art collection, or by typing in your own.

The program also features a paint program, allowing the user to write and design personal creations.

Postcards is available for the Commodore 64 at a suggested retail price of $24.95.

Activision, P.O. Box 7286, Mountain View, CA 94039

Circle Reader Service Number 221.

New Language For 64

Trident Software has introduced *64-Tran*, a FORTRAN Development Environment for the Commodore 64. (CP/M is not required.) It allows the user to write programs in a language other than BASIC. The program can take a source program and generate relocatable machine code. Source programs can be generated using any word processor that outputs sequential files, or you can use a translator, which is included, to allow the use of the Commodore 64 built-in editor. Also included is a Linker/Loader, which combines the machine code from your program with system machine code to create a new program.

64-Tran uses standard FORTRAN statements with enhancements. The program can be used on the Commodore 128 in 64 mode.

Suggested retail price is $50.

Trident Software, P.O. Box 180, Glenelg, MD

Circle Reader Service Number 222.

Time-DOS And Dragsters

Family Software has announced the release of *Time-DOS*, a date- and time-stamping utility, and *Drag Race Eliminator*, a simulation of professional drag racing.

Time-DOS wedges into the 64 or 128 operating system and provides ten new direct-mode commands, plus a realtime calendar clock. Program files can be stamped automatically with the date and time when created, accessed, or both. All files can be stamped manually either in direct mode or under program control. The new directory provides the usual information, plus the date and time stamp for each file. The disk contains both *Time-DOS 64* and *Time-DOS 128* and has a suggested retail price of $19.95.

Drag Race Elminator has five classes of NHRA competition that permit the user to practice time trials, compete with the computer, or race another player. Written entirely in machine language, this Commodore 64 game uses music and sound, multicolor hi-res graphics, and a 3-D split screen view of the track. The sophisticated timing system includes a Pro-Start Christmas Tree, individual elapsed-time clocks, reaction timers, and win lights. Times are computed to within 1/1000 second.

Drag Race Eliminator has a suggested retail price of $24.95.

Family Software, 3164 Surrey Ln., Aston, PA 19014

Circle Reader Service Number 223.

Sound Librarian

Sound File by Blank Software is a complete sound and sequence librarian for the Ensoniq ESQ-1 Digital Wave Synthesizer with a Commodore 64.

Sound File supports up to four on-screen sound banks, flexible patch/sequence dumps, mouse-driven sound swapping, as well as sound and sequencer storage. Its autosort patch libraries help to organize patches into characteristic groups like strings, effects, or electronic percussion up to 120 patches long.

With its built-in sequencer, you can name swap, store, and transfer song and sequence files individually or in groups. It uses pull-down menus for easy-to-learn operation. Suggested retail price is $69.95.

Blank Software, 1034 Natoma St., San Francisco, CA 94103

Circle Reader Service Number 224.

New Titles And Price Cuts From Cosmi

Cosmi has released three new simulations for the Commodore 64: *Shirley Muldowney's Top Fuel Challenge*, *Chernobyl*, and Steve Garvey vs. Jose Canseco in *Grand Slam Baseball*. Each has a suggested retail price of $24.95.

Cosmi also has reduced the prices of several of its popular software programs. *Super Huey*, a helicopter flight simulator that has sold over 150,000 copies, is now selling at a suggested retail price of $12.95. Also reduced to $12.95 are Paul Norman's *Forbidden Forest* and Richard Petty's *Talladega*, a 3-D NASCAR racing simulation.

Cosmi, 415 N. Figueroa St., Wilmington, CA 90744

Circle Reader Service Number 225.

Boxing From Activision

Activision has announced the addition of *Star Rank Boxing II* to its Gamestar line of sports simulation software. Two players can square off against each other in exhibition action, or one player can compete against computer opponents.

In the exhibition mode, players may fight in one of three weight classes and can create up to five fighters in each class. Players must fight four computer challengers, each more skillful than the one before, to win the title.

Before each fight, the "Tale of the Tape" shows the boxer's height, weight, reach, age, record, and how he compares to the current champion and other contenders in the division. The game's animation gives fighters the ability to block and duck punches, throw crosses, jabs, uppercuts, and body shots.

The game is available for the Commodore 64 and retails for $29.95.

Activision, P.O. Box 7286, Mountain View, CA 94039

Circle Reader Service Number 226.

Celebrity Cookbook

Merrill Ward has introduced an electronic cookbook for the Commodore 64 that includes such favorites as Ronald Reagan's recipe for bell peppers stuffed with corned beef hash.

The Celebrity Cookbook, Vol. 1 features music and color graphics, and utilizes a single-key approach to call up and print out recipes, to determine how much liquor to buy for a party, or to calculate ingredients for different guest lists.

The program's recipe filer features word wrap, a find feature, and permits the use of Commodore drawing keys to decorate and design recipes.

The Celebrity Cookbook, Vol. 1 has a suggested retail price of $29.95, while volumes 2–6 retail for $14.95 each.

Merrill, Ward, 255 N. El Cielo Rd., Suite 222, Palm Springs, CA 92262

Circle Reader Service Number 227.

All programs listed in this magazine are available on the GAZETTE Disk. Details elsewhere in this issue.

SUPER DISK UTILITIES

for the C128 & 1571

Super Disk Utilities is the ultimate utilities disk for the 1571 disk drive and C128 computer. Super Disk Utilities is a full featured disk utility system that will perform virtually every CBM DOS function available. No need for numerous utility disks to perform various functions. SDU does it all!

- Copy whole disks (with 1 or 2 drives)
- Perform many CP/M and MS-DOS utility functions
- Edit any track or sector with the Super Disk Editor
- Perform numerous DOS functions such as rename a disk, rename a file, change disk format (without affecting data), scratch or unscratch files, lock or unlock files, erase a track or a whole disk, create auto-boot and much more!

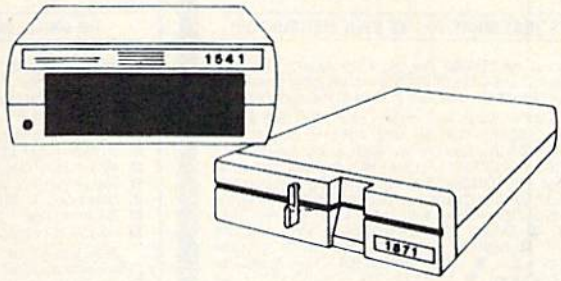
SDU helps you learn the inner workings of the 1571 drive with the 1571 Memory Monitor and unique RAM Writer. With these options you can assemble, disassemble any section of drive RAM or ROM. Use the Ram Writer to program the 1571 RAM yourself! SDU uses an options window to display all possible choices available at any given time. No need to memorize hidden commands. SDU fully supports a second 1571 drive. Many of the utility functions also work on the 1541 drive. SDU performs many MFM utility functions including analyze MFM disk format, format MFM disks, read a CP/M + directory, format in CP/M + (GCR format) and more. Super Disk Utilities is available for only $39.95!

THE COMMUNICATOR

Fastest, easiest, most efficient, most feature-packed terminal program for the C64. Among its many features are:

- Menu selected options
- User selected/defined baud rates
- Very large buffer capacity
- Macro Key options
- Send/receive files with or without X-modem protocols
- Video attribute options including 40, 64, 80 column display
- File conversion options include text to BASIC, Pet-ASCII to ASCII, program to image
- Terminal emulation capability includes Tektronix -4010 graphics protocol
- Alarm Clock/Timer
- Autodial features
- DOS Command menus, file copy utility
- Written 100% in assembly language
- Easy to use instruction manual

All these features and more for only **$39.95!**



1541/1571 Drive Alignment

1541/1571 Drive Alignment reports the alignment condition of the disk drive as you perform adjustments. On screen help is available while the program is running. Includes features for speed adjustment and stop adjustment. Complete instruction manual on aligning both 1541 and 1571 drives. Even includes instructions on how to load alignment program when nothing else will load! Works on the C64, SX64, C128 in either 64 or 12 mode, 1541, 1571 in either 1541 or 1571 mode! Autoboots to all modes. Second drive fully supported. Program disk, calibration disk and instruction manual only **34.95!**

Super Disk Librarian - Full featured disk cataloging & library system for the C128 in 128 mode - **$29.95**

Super 64 Librarian - Disk cataloger for the C64 - **$29.95**

Mr. Quizzer - Test making program for the C64 or C128 - **$19.95**

Spirit Writer - Word processor for the C64. Includes 30,000 word spelling checker. Only **$29.95!**

Fun Biorhythms - Print personalized Biorhythms on your printer. For the C64. Only **$9.95!**

CHRISTMAS CLASSICS

Place your C64 or C128 in a holiday mode with Free Spirit's renditions of these all-time Christmas favorites. Joy to the World, Deck the Hall, Twelve Days of Christmas; O Tannenbaum and Jingle Bells are among the over 40 songs included. Only **$9.95!**

Free Spirit Software, Inc.

538 S. Edgewood
LaGrange, IL 60525
(312) 352-7323

FREE SHIPPING & HANDLING!

Order with check, money order, VISA/Mastercard. Illinois residents add 8% sales tax.

MasterCard VISA

ALL NEW

Kracker Jax Revealed: BOOK II

LEARN ABOUT COPY PROTECTION FROM THE EXPERTS!

Our knowledge of protection schemes has made us famous. And we can pass that knowledge on to you! **Kracker Jax Revealed: BOOK II** is our latest release in a series of tutorial guides designed to instruct you in the fascinating areas of copy protection schemes and how to defeat them.

BOOK II continues the tradition which began with the original: with nothing more than a basic grasp of machine language, you can learn to control some of the newest, most advanced copy protection routines on the market today! Here's what you'll get with **BOOK II**: ■ Detailed info using 20 current new programs as examples! ■ An enhanced, all new utility disk with 20 new parameters! ■ The famous Rapidlok™ copy system REVEALED! ■ EXTRA BONUS—The legendary Hes Mon™ cartridge!

Don't be intimidated by complex protection routines. Learn how to take control of your expensive software. After all, knowledge IS power.

BOOK I IS STILL AVAILABLE!

Only $23.50 each. Please allow 2 weeks for delivery.

Orders outside of North America must add $7.50 for shipping!

ALL NEW

Kracker Jax

THE REVOLUTIONARY ARCHIVAL SYSTEM!

Kracker Jax is the powerful parameter-based copying system that has taken the country by storm! What IS a parameter? It's a custom program that allows your 1541 or 1571 disk drive to strip ALL copy protection from your expensive software, leaving you with UNPROTECTED, TOTALLY BROKEN BACKUPS that can even be copied with a simple fast copier!

We declare **Kracker Jax** to be the best system of its kind on the market today! A bold claim? Maybe.

But don't take our word for it—if you want the REAL story on how good **Kracker Jax** is, just ask one of our customers. Don't worry. You won't have any problem finding one.

■ Easy to use—no special knowledge is required! ■ Powerful—will easily back up titles that nibblers can't! ■ Superfast—strips protection in a matter of seconds! ■ Great value—each volume has approx. 100 parameters! ■ Current—new **Kracker Jax** volumes released quarterly!

ALL NEW VOLUME SIX IS NOW AVAILABLE—ORDER TODAY!

Kracker Jax Volumes 1–5 are still available.

All **Kracker Jax** Volumes are **$19.95** each.

The C128 Cannon

IT'S JUST WHAT YOU'VE BEEN WAITING FOR!

Here's the package that you C128 owners have been waiting for! The C128 CANNON gives you more power than you ever hoped for! Just look at some of these utilities:

■ NIBBLER—Works with single or dual 1571/1541 drives! ■ FAST COPIER—Use for data disks or **Kracker Jax!** ■ FILE COPIER—Easy file maintenance and manipulation! ■ 1581 FAST COPIER—For the new high speed 3.5" drive! ■ 1581 FILE COPIER—For high speed file manipulation! ■ MFM COPIER—Copies unprotected IBM & CP/M disks! ■ T/S EDITOR—Works with 1541, 1571, and new 1581 drives! ■ ERROR SCANNER—Complete with on-screen display! ■ DENSITY SCANNER—Find altered densities track by track! ■ DIRECTORY EDITOR—Alter & organize disk directories! ■ **KRACKER JAX** BONUS—100 of our hottest parameters!

You've seen nibblers alone that sell for thirty-five or forty dollars. And the 100 **KRACKER JAX** parameters are a twenty dollar value. Yet the entire C128 CANNON package sells for just $34.95. Never before has this much power been integrated into a single, affordable product. If you own a C128, you don't need to feel left out in the cold anymore. Other companies may ignore you, but at **KRACKER JAX**, we know a powerful machine when we see one.

Let US show YOU just how powerful your C128 really is. Order your C128 CANNON today!

Only $34.95

ALL NEW

Shotgun II

THE DOUBLE BARRELED NIBBLER IMPROVED!

We've taken The Shotgun, our popular nibbler, and completely rewritten it to provide more power, more speed, and even more features than before! The result is **Shotgun II**, the new standard in high powered nibblers.

■ Capable of making copies using one or two drives! ■ Shotgun II can easily copy data clear out to track 40! ■ Auto density detection can easily be toggled on or off! ■ The single drive copier has an on screen GCR display! ■ Allows you to list directories from either disk drive! ■ Superfast new "True Dual" two drive copier mode! ■ Capable of copying Rapidlok™ programs automatically!

And here's the good part: we've increased the performance WITHOUT increasing the price! Like the original, **Shotgun II** is available in either of two formats. 1) The **Shotgun II**, which is the utility described above. 2) The Loaded **Shotgun II**, which is the same utility packaged along with 32 of the hottest **Kracker Jax** parameters ever produced! And if you already own the original Shotgun, just send us your disk along with $9.95 for **Shotgun II**.

Either way you order it, **Shotgun II** will do the job for you!

The Shotgun II: Only $14.95
The Loaded Shotgun II: Only $19.95

The Bull's-Eye

SO GOOD, EVEN WE CAN'T BELIEVE IT!

Rapidlok™. It's one of the toughest copy protection routines on the market today, and it's being used by several major software houses to copy-prohibit some of the finest titles available for the C64.

Now, you could go broke buying expensive "official" backups of programs you've already paid for. Or, you can exercise your legitimate right to make your own backups. No special knowledge or experience is required. All you need are a few blank disks and five minutes of time. Bull's-Eye lets you create your own custom Rapidlok™ copiers to backup your expensive software!

We've included several custom Rapidlok™ copiers that we created ourselves, just to get you started. **Bull's-Eye** also features a powerful new GCR nibbler developed specifically for this system!

And if all that isn't enough, **Bull's-Eye** also contains a revolutionary new copy system for GEOS™! It is the first copy system to be used exclusively within the GEOS™ environment. Fully icon driven, it runs directly from the GEOS™ desktop! And our utility doesn't just standardize GEOS™ programs, it actually neutralizes them; your GEOS™ programs are completely unprotected!

We've taken careful aim at your archival needs and hit the target dead center—right in the **Bull's-Eye!**

Only $19.95

GEOS™ is a registered trademark of Berkeley Softworks.™

On-Line Help

WORKING IN BASIC? LET YOUR COMPUTER HELP!

Picture this: you're hard at work on your latest program when, right in the middle of line 520, you need some obscure bit of information. You know you've got the info somewhere . . . maybe in a book or a magazine, maybe it's on an old wall chart, or maybe it's in the gigantic reference manual; you know, the one with 30 pages just for the index alone . . .

Good luck—by the time you finally find the information you need (if you ever do), you'll probably have forgotten what you were working on in the first place! But that can't happen to you if you're using ON-LINE HELP!

ON-LINE HELP is an invaluable new aid for BASIC programmers. Forget about all of those tattered books and lost charts—just load ON-LINE HELP into your C/64 at the beginning of a session. Then, at the touch of the F1 key, you're given a menu of available help screens to choose from!

ON-LINE HELP gives you 17 screens of info, including:
ASCII character set ■ POKEs ■ color codes ■ selected DOS commands ■ useful memory commands ■ BASIC keywords, abbreviations, and token values ■ sound registers ■ musical notes in all 8 octaves ■ and location 197 last key pressed! And ON-LINE HELP uses almost none of the RAM available for BASIC programming!

Once you've gotten the information you need, a simple touch of the "X" key returns you to BASIC, exactly where you left off, even if you were in the middle of a program run! Get ON-LINE HELP today—and let your computer do some of the work for you!

Only $19.95

MSD Dual Cannon

POWERFUL UTILITIES FOR POWERFUL EQUIPMENT!

If you own an MSD dual drive, you own a superb piece of high tech equipment. But if you don't own the right utilities, you're not getting all of the performance that your MSD drives can deliver. What kind of utilities? How about:

■ A NIBBLER—copies protected programs bit by bit! ■ A FAST COPIER—won't write errors/perfect for data! ■ A FILE COPIER—make your file maintenance tasks easy! ■ FULL AUTO MODE—copy disks without your computer! ■ A SECTOR EDITOR—created specifically for the MSD! ■ **KRACKER JAX** PARAMETERS—32 of our best parameters!

These utilities are special. For example, both the nibbler and the fast copier can copy a disk in about a minute. The file copier can file copy an entire disk in just one pass, regardless of the number of directory entries. And both the nibbler and the fast copier feature an AUTO MODE that, once loaded, allows you to disconnect your MSD from the computer. The source disk can stay in the drive—the indicator lights on the MSD tell you when to change destination disks. If you have another drive, you could use your system for other things while your MSD drives were working on mass duplication tasks. And the sector editor allows you to either disassemble or edit a sector. It identifies standard op-codes, undocumented op-codes, and BASIC tokens. It even has full control over printer options!

We've even included 32 free **Kracker Jax** parameters. We're making it very easy for you to own the best—order yours today!

Only $34.95

ALL NEW

C128 Helper

THE FIRST ELECTRONIC C128 REFERENCE MANUAL!

If you've ever found yourself needing information while right in the middle of programming, have we got a utility for you!

The C128 Helper is the first electronic reference manual for the C128. Let's say that you're right in the middle of writing a program in the powerful BASIC 7.0 language when you realize that you need more information on a specific command. Just touch the C128's HELP key. Almost instantly (thanks to the 1571's "fast" mode) a menu appears on your screen. Just select the command in question, and moments later a full screen of detailed information appears, including an example showing the command in use. And at the touch of another key, that screen of data is dumped to your printer. You're then returned to your BASIC program, exactly where you left off!

The C128 Helper is machine language driven for speed. It works in the C128's 80 column mode with an RGB or composite monitor. You can use either a 1571 or, with slightly slower response time, a 1541 drive.

The C128 Helper is co-resident with your BASIC program. With it, ALL BASIC 7.0 commands and functions are detailed with full explanations and examples. It also allows you to perform a screen dump from BASIC.

But perhaps the single most exciting feature is this: the program is user definable. Not only can you modify the C128 Helper itself, but you can actually edit and create your own custom files! The program guides you with prompts, helping you to easily construct your own custom applications, complete with menus! You could make your own memo pads, calendars, electronic helpers for other programs—the list is endless!

But even if you only use the C128 Helper itself, you'll be getting more than your money's worth. Get your copy today!

—ELECTRONIC HELP FOR ALL BASIC 7.0 COMMANDS—

—PLUS—

■ ASCII Code set! ■ BASIC keywords! ■ Screen POKE codes! ■ BASIC abbreviations! ■ Useful memory locations! ■ BASIC tokens!

Only $24.95

ALL NEW

SYSRES™ Enhanced

WE'RE GOING TO CHANGE YOUR MIND ABOUT BASIC!

Maybe you've never paid much attention to BASIC. Figured it was just a low powered language for kids and beginners. If that's what you think about BASIC, then you've never heard of SYSRES™.

SYSRES™ resides in memory, out of the way. It is the ULTIMATE BASIC enhancement system for the C64 or C128 in the 64 mode. SYSRES™ adds over 25 major commands and over 1000 additional functions to standard BASIC. No, that wasn't a typo. Twenty-five MAJOR commands. One THOUSAND additional functions. Impressed? There's more.

SYSRES™ features an extended Super DOS-wedge, reducing even the most complex command sequences to a few simple keystrokes. It also allows you to scroll both forward and backward through your BASIC programs. We've even added an all new fast loader routine to make loading up to 5 times faster.

SYSRES™ is addictive to programmers, but not to the programs themselves—no run time library is needed for programs created with SYSRES™. Don't take our word for it. Just ask any expert BASIC programmer what the best C64 BASIC extension system on the market is—he'll say "SYSRES™!"

—SAMPLE SYSRES™ COMMANDS—

■ APPEND ■ DELETE ■ LIST ■ RUN ■ AUTO ■ DUMP ■ LOAD ■ SAVE ■ BLOAD ■ EXEC ■ MERGE ■ SETD ■ BRUN ■ FIND ■ MON ■ SETP ■ CHANGE ■ GET ■ OLD ■ TRACE ■ CLOSE ■ KEYS ■ PUT ■ VERIFY ■ CMD ■ KILL ■ RENUMBER ■ WHY

SYSRES™ is unprotected and comes complete with over 110 pages of comprehensive documentation bound in an attractive, durable three ring binder. If you're REALLY interested in programming, order SYSRES™—and discover a BASIC that you never even knew existed!

Only $39.95

Hacker's Utility Kit

USE THE SAME TOOLS THAT THE EXPERTS USE!

Are you ready to take control of your software? Let us help! Our Hacker's Utility Kit contains the most impressive array of tools ever assembled in a single package!

Our top **Kracker Jax** programmers put together a "wish list" of tools that they wanted to work with—and then went to work creating the perfect set of utilities. The result: The Hacker's Utility Kit. Now YOU can use the same powerful utilities that WE do—at a fraction of their true development costs! Here's what you'll get:

■ WHOLE DISK SCANNER—usage, error, density info fast! ■ GCR EDITOR—view raw data the way your system sees it! ■ FAST DATA COPIER—absolutely will NOT write errors! ■ 1 OR 2 DRIVE NIBBLER—fast & powerful/state of the art! ■ FILE TRK/SCTR TRACER—find any sector link in a file fast! ■ BYTE PATTERN FINDER—finds any pattern anywhere! ■ CUSTOM COPIER CREATOR—the ONLY one of its kind! ■ RELOCATABLE M/L MONITORS—including drive monitor! ■ FAST FORMATTER—programmable tracks or whole disk! ■ DISK FILE LOG—quickly find file start/end addresses!

Professional mechanics and programmers have one thing in common: they both use the finest tools available. These tools were developed specifically to meet the demanding needs of our **Kracker Jax** programmers. They are utilities created by experts, refined under constant use, and perfected for you.

Only $19.95

SuperCat

THE ULTIMATE DISK CATALOG SYSTEM!

Are you tired of searching endlessly through your disks to find the one title that you're interested in? Frustrated by catalog programs that run out of memory or storage space every time your disk library grows? Then NOW is the time to invest in SuperCat, the most sophisticated disk cataloging system available for your Commodore 64!

SuperCat allows you to catalog up to 640 disk directories—up to 1,280 with two drives! You can index and alphabetize over 5,000 titles—and up to 10,000 with two drives! SuperCat will accept disks with duplicate ID's. With a printer, you'll be impressed by the variety of report formats available to you. You can list titles in alphabetical order or by disk. Disk header lists can be sorted by name, disk ID, date cataloged, blocks free on disk, and disk number! You can even print disk labels in any of three different formats!

SuperCat is incredibly fast—it can find ANY title in just 10 seconds, and can sort 1,000 titles in a mere 8 seconds! And SuperCat comes with a comprehensive, illustrated, indexed manual, although you probably won't need it much—our extensive menus and help screens see to that.

Face it—if you're going to go to the trouble of cataloging your library in the first place, you may as well use the best tool on the market. SuperCat.

Only $24.95

Graphic Label Wizard

THE GREAT NEW GRAPHICS LABEL UTILITY!

Oh boy. Another graphic labeling utility. Zzzz.

Don't kid yourself. We're the same people who brought you SuperCat, and we couldn't make a boring utility if our lives depended on it! Able to use Print Shop™, Print Master™, Software Solutions™, or compatible graphic images, The Label Wizard is designed to take advantage of the huge library of graphics utilized by these programs. And that's just the beginning. Take a look at these features—and then order your copy today!

■ Print a graphic & up to 8 lines of text on a mailing label! ■ Easy to use menus featuring fast Pop Up Windows! ■ Save labels to disk for later modification & printing! ■ Print one label or print all labels from your data disks! ■ Automatically print multiple copies of your favorite labels! ■ Flexible—you can print your labels 1, 2, 3, or even 4 across! ■ Label Wizard includes over 50 exciting new graphics—FREE! ■ Print catalog showing 28 disk graphics and title per page! ■ Use Epson compatible or create your own custom printer file! ■ Print text in any combination of styles your printer supports! ■ Hi res display allows you to load and preview up to 4 graphics simultaneously—even from 4 different disks!

Only $24.95

ALL NEW

Graphic Art Disks

HOT NEW CLIP ART FROM SOFTWARE SOLUTIONS™!

Let's face it: you can be a bright, talented, creative person—and STILL not be able to draw a straight line with a ruler.

Well, we can help. Each of our Graphic Art Disks features 100 outstanding hi res graphics, covering a wide range of subjects and topics, created by professional artists.

We've got graphics for holidays, graphics for sporting events, animal and people graphics, pets, kids, cars, boats, planes, signs, things, places, the list goes on and on. Your use for them is limited only by your own imagination. For signs, cards, banners, invitations, flyers, or whatever you have in mind, you'll find an image that's just right!

Each disk features these graphics in BOTH Print Shop™ (side A) and Print Master™ formats! And these graphics also work with our own superb Label Wizard programs as well. Graphic Art Disks: great art was never so affordable!

DISKS 1-5 AVAILABLE
Only $14.95 each

ALL NEW

Super Snapshot Slideshow Creator

THE DYNAMIC NEW COMPANION UTILITY FOR SUPER SNAPSHOT 64 OWNERS!

This is HOT! You know that Super Snapshot 64 can capture a multicolor or hi res display on your screen and save it to disk as a "file." Our new Slideshow Creator lets you display a series of these images, with dynamic options such as fade in and out, shutter on and off and pop on and off, and your choice of 10 different fonts for creating your own custom scrolling captions! We've even included programming to allow you to easily integrate hi res or multicolor screens into your own M/L or BASIC programs with full control! Check out these features:

■ REQUIRES the Super Snapshot cartridge to create! ■ Does NOT need Super Snapshot cartridge to display! ■ Display at least 12 slides with 1541 or 24 with 1571! ■ Slideshow can even be ported to the new 1581 disk drive ■ Super Snapshot Slideshow Creator supports two drives! ■ Includes fade in/out and pop on/off special effects! ■ 10 fonts available for custom scrolling text displays! ■ Built in fast loader routine for high speed displays! ■ Amazing low price—ORDER YOURS TODAY!

Only $14.95

COMPUTER MART

Need more info? Call or write for our free catalog

Program submissions wanted! Good Commissions—National Marketing.

CHECKS, MONEY ORDERS OR VISA/MASTERCARD.
Mail your order to: Computer Mart
2700 NE Andresen Road/Vancouver, WA 98661
Phone orders welcome: 206-695-1393
Same day shipping/No C.O.D. orders outside U.S.

VISA MasterCard DISCOVER

PLEASE NOTE: Free shipping & handling on all orders • C.O.D. add $4.00 to total order • All orders must be paid in U.S. funds. Washington residents add 7.30% sales tax to order. Orders outside of North America add $4.00 per software selection and $7.50 per book or hardware.

DEALERS—WE HAVE THE SUPPORT YOU'RE LOOKING FOR!

WAREHOUSE CLEARANCE SALE!
MANY ITEMS BELOW COST!

Panasonic Industrial Company

KX-PI080*i* — 120 C.P.S. — **$139.95***

KX-P1091*i* — 160 C.P.S. — **$179.95***

W/2 RIBBON PURCHASE*

KX-P1092*i* — 240 C.P.S. — LASER $CALL — **$279.95***

KX-P1592 — 180 C.P.S. — 1080 i-II, 1091 i-II $Call — **$379.95***

SEIKOSHA

- w/2 ribbon purchase

SP180VC — **$129.95***

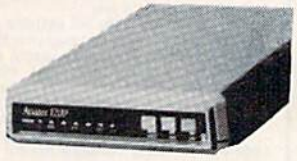
300CPS...275* SP1000VC — **$139.95***

ALPS ALQ200
24PIN/COLOR

240 C.P.S. DRAFT
1YR. WARRANTY
80 C.P.S. L.Q.
EPSON/IBM COMPATIBLE

$399.95

Avatex



1200 Baud . . . **$79.95***
1200 Internal . . . **$99.95**
1200 H.C. **$99.95***
2400 Baud . . . **$199.95***

*w/cable purchase

DISKS & ACCESS.

3½ DS/DD (30 lot)	$1.30
3½ SS/DD (30 lot)	$1.00
3½ DS/DD(30 lot)	$1.30
MOUSE PAD	$6
CASIO CZ101	$250
CASIO 700	$300

NAME BRAND
GENERIC 5¼ DS/DD
LIFETIME WARR. **25¢** 100 Lot Qty.

3½ DISK CASE (30)	$8
5¼ DISK CASE (75)	$8
DISK HEAD CLEANERS	$8
1750 RAM	$160

SPECIALS

Printer Cable For GEOS	$19.95
Canon Color Ink Jet	$299.95
Joy Sticks	from $5
Printer Muffler	$49.95

CLOSEOUT
Computers • Monitors • Printers
1-of-a-kinds • Discontinued • Far Below Cost
$CALL
Software From $1.29

FSD-2

- Quieter
- Cooler
- 1 yr Warr

$149.95*
*Package Pricing

commodore Educator 64

$149.95*
Completely Commodore Compatible

commodore SFD 1001 (1 Meg)

$149.95*
***PACKAGE PRICING**

commodore Hard Drives

9060 — **$450***
XETEC/I.C.T. CALL

commodore MPS 8023

160 C.P.S. 15"

$99.95*
Limited Qty.
*Completely Refurbished

AMIGA NEW RELEASES

Terripods	$ 24	Dark Castle	$ 24	Deluxe Print II	$ 48	Earl Weaver Baseball	$Call
GEN-LOCK	$108	Sculpt 3D	$ 60	Word Perfect	$240	Lounge Lizards	$ 30
Ferrari Formula	$ 30	Gold Runner	$ 24	Laser Script	$ 27	Page Flipper	$ 30
Faery Tale Adv.	$ 30	Calligrapher	$ 60	Surgeon	$ 36	Videoscape 3D	$120

ALL SOFTWARE AT LEAST 40% OFF

FREE T-Shirt with the purchase of any (2) Electronic Arts Products! While Supply Lasts

Bard's Tale	$24.00
Bard's Tale II	24.00
Chessmaster2000	24.00
World Tour Golf	18.00
Marble Madness	18.00
Pegasus	18.00
Moebius	24.00
Murder Party	21.00
Ogre	24.00
Ultima IV	36.00
Auto Duel	30.00
Scrabble	21.00
America's Cup	21.00
Artic Fox	24.00
All Classics	9.00
Amnesia	24.00
Bismark	21.00
Chuck Yeager	21.00
Tobruk	21.00
Paper Clip III	30.00
Outrageous Pages	30.00
Clue Books	$CALL

MINDSCAPE

Defender of the Crown	$21.00
Bop and Wrestle	18.00
Super Star Hockey	21.00
High Roller	18.00
Indoor Sports	18.00
Infiltrator	18.00
Parallax	18.00
Uridium	18.00

ACCOLADE

Hard Ball	$17.00
Apollo	$CALL
Test Drive	$CALL
Ace of Aces	18.00
Comics	18.00

Berkeley Softworks

GEOS	$34.00
GEOS Fontpak 1	18.00
GEOS Desk Pack	21.00
Writer Work Shop	30.00
Geodex	24.00
GeoCalc/GeoFile	30.00
GeoCable	24.00
GEOS 128	$CALL
Geopublish	35.00
Geoprogrammer	$CALL

Abacus

Abacus Books	$SAVE
GEOS In and Out (Disk)	9.00
Basic 128	36.00
Basic 64	24.00
Cadpak 128	36.00
Cadpak 64	24.00
Chartpak 128	24.00
Chartpak 64	24.00
Cobol 64	24.00
Cobol 128	36.00
Super C Compiler 64/128	36.00
Super Pascal	36.00

ACCESS Software Incorporated

MACH-128	$28.50
Leaderboard	24.00
Echelon	27.00
World Class Leaderboard	22.50
10th Frame	24.00
Exec Tournament	12.00
Tournament 1	12.00
Triple Pak	12.00
Famous Course	12.00

ACTIVISION

Portal	$24.00
Titanic	18.00
Labrynth	21.00
Aliens	21.00
Last Ninja	$CALL
Hacker II	21.00
Top Fuel Elim	$CALL
Game Maker	24.00
Music Studio	18.00
Maniac Mansion	$CALL

SPRINGBOARD

Certificate Maker	$28.00
Newsroom	30.00
Clip Art 1	18.00
Clip Art 2	24.00

Firebird

Knight Ork	$24.00
Golden Path	$CALL
Pawn	24.00
Talking Teacher	24.00
Guild of Thieves	24.00

UNISON WORLD

Art Gallery	$16.00
Art Gallery 2	16.00
Print Master	21.00

PRECISION

Superbase 128	$60.00
Superbase 64	48.00
Superscript 128	48.00
Superscript 128	48.00
Visastar 64	$CALL
Visawrite 128	$CALL
Microlawyer	$CALL

HI TECH

Card ware	$ 6.00
Heart ware	6.00
Party ware	6.00
Ware with all	9.00

Broderbund Software

Printshop	$25.00
Graphics Lib.	15.00
Carmen Sandiego	21.00
Karateka	18.00
Print shop comp.	21.00

LOGIC

Flight Sim II	$28.50
Scenery Disk	12.00
Jet	30.00
Football	24.00
Baseball	30.00

TIMEWORKS

Data Mgr. 128	$36.00
Swiftcalc 128	36.00
Wordwriter 3	30.00
All business titles	36.00
Partner 64	36.00
Partner 128	42.00
Sylvia Porters	36.00
Desktop Publisher	$CALL

MicroProse

Gunship	$20.00
F-15	21.00
Project Stealth Fighter	24.00
Airborne Ranger	24.00
Silent Service	24.00
Pirates	24.00
Top Gunner	18.00

Xetec Inc

Font Master II 64	$30.00
Font Master 128	36.00

SSI

Gemstone Healer	$18.00
Gettysburg	36.00
Kampfgruppe	36.00
Phantasie 2	24.00
Ring of Zelfin	24.00
Road War 2000	24.00
Shard of Spring	24.00
Wizard's Crown	24.00

Micro League

Micro L. Baseball	$24.00
General Mgr.	24.00
Stat Disk	15.00
86' Team Disk	12.00

Digital Solutions Inc.

Super Pack 64	$36.00
Super Pack 128	45.00
Pocket Writer 2/Filer Planner	36.00
Super Pack 2 (128)	60.00
Pocket Writer 128/Filer/Planner	30.00
Pocket Writer 64/Filer/Planner	24.00

EPYX

FastLoad	$22.50
Rad Warrior	$CALL
Street Sports-Baseball/Basketball	24.00
World Karate Champ	15.00
Summer Games II	20.00
Super Cycle	24.00
World Games	24.00
Football	20.00
Multi-Plan	24.00
Winter Games	20.00
Sub Battle	24.00
California Games	24.00
Echelon	$CALL
Boulder Dash Construction	$CALL
Spy vs. Spy III	$CALL

NEW RELEASES

Clue Books	$CALL
Star Dos	$CALL
Dan Dare	12.00
Dungeon Runners	18.00
Earth Orbit Station	18.00
Instant Music	18.00
Legacy of Ancient	18.00
Patton vs. Rommel	18.00
Skate or Die	18.00
Tomahawk	18.00
Monopoly	24.00
Mavis Beacon Piping	24.00
Mini Putt Golf	$CALL
King of Chicago	30.00
Thunder Chopper	18.00
Bop n' Rumble	18.00
NBA	$CALL
Fourth & Inches	$CALL
Nord and Bert	21.00
Mousetrap	12.00
Business Card Maker	$CALL

NEW SOFTWARE/BOOKS ARRIVING DAILY $CALL

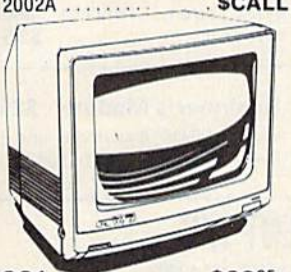
PRICES MAY BE LOWER! . . . . $CALL

commodore

64c $129.95*
128 . . . . . $189.95*
128D $429.95
C64 . . (REFURBISHED) . $99.95
*package pricing

EXCEL-71 . . . . . $Call
1581 . . . . . $179.95
1541c $169.95
1571 . . . . . $219.95

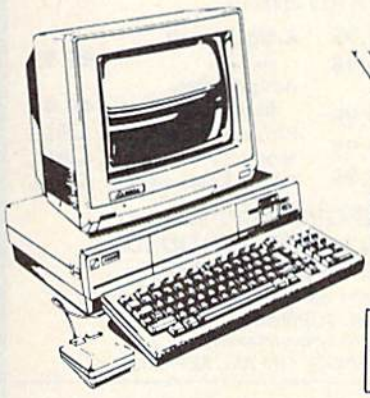
2002A . . . . . $CALL



1901 (monochrome) $99.95
1802c $189.95
1902A $239.95

OKIMATE 20 . . . $99.95*
1351 . . . . . $39.95
Plug & Print . . . . $CALL
Roland Plotters . . . . . $Call
1764 RAM . . . $125.00

COMPLETE AMIGA LINE . . . . $CALL



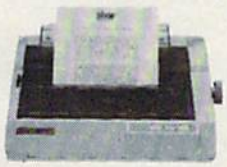
AMIGA 500 SPECIAL PROMO!

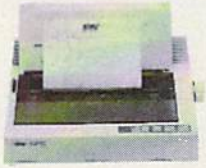
USER GROUPS
PACKAGE A $89.95
PACKAGE B $179.95

GENLOCK . . . $220.00	DIGI-VIEW	$120.00	1010 DRIVE . . . $200.00 40 MEG $900.00
1680 MODEM. $120.00	512K RAM	$120.00	2 MEG $349.95 20 MEG $649.95
256K $80.00	MARAUDER II	$24	1 MEG WITH CLOCK $260.00

AUTHORIZED AMIGA SALES & SERVICE
G064 EMULATOR $99.95

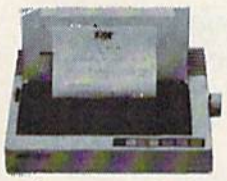
star micronics PRINTERS





star NP-10 *124.95
star NX-10 *149.95

NB2415 • NR15 • LASERS • $CALL



star NB-2410 *379.95
star NX-15 *279.95
OTHER 15" STAR PRINTERS FROM $230

***WITH PURCHASE OF TWO RIBBONS**

commodore IBM COMPATIBLE

- 512K
- 360K Dual Sided Drive
- CGA Board
- One year warranty
- Parallel Port
- Serial Port
- GW BASIC
- DOS 3.2

FREE SIDEKICK BY BORLAND

PC10-1 $474.95
PRICES MAY BE LOWER! $CALL
DUAL DRIVE 640K
PC10-2 $574.95
COMMODORE PC-AT . . . $CALL
20 MEG . . . ~~$299.95~~ Seagate w/controller NEW PRICING . CALL
30 MEG . . . ~~$349.95~~

ORDERS ONLY **800-433-7756**
IN MICH. 313-427-7713
CUSTOMER SERVICE **313-427-0267** M-F 10-6
Monday thru Friday – 10:00 A.M. to 8:00 P.M.
Saturday – 10:00 A.M. to 6:00 P.M. (E.S.T.)

SCHOOL P.O.'s ACCEPTED CALL FOR TERMS

M.C.S.

MICROCOMPUTER SERVICES

DEALER INQUIREES INVITED

No Surcharge for MC/VISA/DISCOVER — Sorry no walk in traffic
All returns must have RA#. Merchandise found defective will be repaired or replaced. We do not offer refunds for defective products or for products that do not perform satisfactorily. We make no guarantees for product performance. Any money back guarantee must be handled directly with the manufacturer. Call for shipping & handling info. Prices subject to change without notice.
12864 FARMINGTON ROAD, LIVONIA, MI 48150 — We cannot guarantee compatibility.

FACTORY AUTHORIZED

COMMODORE REPAIR CENTER

1-800-772-7289

(312) 879-2888 IL

C64 Repair (PCB ONLY)	42.95	Amiga Repair (PCB ONLY)	99.95
C128 Repair (PCB ONLY)	64.95	Amiga Drive Repair	149.95
1541 Permanent Alignment	29.95	Printers	CALL
1541 Repair	79.95	Monitors	CALL
1571 Repair	79.95	Other Equipment	CALL

CALL BEFORE SHIPPING
PARTS AND LABOR INCLUDED
FREE RETURN SHIPPING
(APO, FPO, AIR ADD $10.00)
24-48 HR. TURNAROUND
(Subject to Parts Availability)
30 DAY WARRANTY ON ALL REPAIRS

COMMODORE PARTS

C-64 Power Supply	34.95
128 Power Supply	59.95
C-64 Over Voltage Sensor	19.95
Other Parts	CALL

(Plus $3.00 Shipping/Handling)
All parts for Commodore equipment usually in stock
For Parts Call (312) 879-2350
Dealer Discounts Available

TEKTONICS PLUS, INC.
150 HOUSTON STREET
BATAVIA, IL 60510
CLIP AND SAVE

MasterCard VISA

ADVANCED DETECTION & CONTROL

NO INTERFACE IS EASIER TO USE

- Control lights, appliances, heating and cooling systems, relays, motors and virtually any electrical device.
- Connect to temperature, light, sound, moisture, fluid level and pressure sensors.
- 32 separate buffered digital output lines.
- 32 separate digital input lines.

BH100 I/O Card — User Manual, instructions, sample programs & diagrams of typical hookups. **$129**

8 Channel A/D Plug-in Conversion Module $45 — Fast 8 bit 0-5V A/D converter.

Complete I/O Course — Includes BH100, Beginner's Module, Course Manual and User Manual. **$159**

Security System Module — With siren, switches and software. **$35**

Beginner's I/O Interface Course Manual $15 — Learn all about interfacing!

Beginner's Module $25 — With 8 LEDs, 8 switches and 1 relay. Requires the BH100.

INTELLIGENT I/O

7 WATER ST. • MASSENA, NY 13662
VISA (315) 769-2716 MasterCard
Call for free brochure today!

Beware of imitations - get the high quality original BH100
Add $4 for postage and specify C-64 or VIC-20.

Introducing...

Super Graphix Gold

Suggested Retail $119.95

With specs that out-perform the *Super Graphix Printer Interface*—the industry standard, the ***Super Graphix Gold*** Printer Interface combines improved speed, features, and memory to satisfy the most demanding user.

* 32K Buffer—built-in
* 32 printer choices
* Supports standard serial from the C-64
* Supports fast serial from the 128
* 8 switch-selectable operating modes
* 16 active DIP switches for unequaled flexibility
* RESET and CLEAR buttons
* LED indicates activity and errors
* 2 built-in screen dumps: 16 sizes, 4 shades, inverse, single and double pass
* 4 fonts built-in and 4 downloadable to RAM
* Utility disk with more than 40 fonts
* Direct-from-disk downloads and dumps
* 21 secondary addresses
* 12 printing channels
* Command channel with more than 35 commands
* Banner channel (uses all fonts)
* 4 new channels for downloading and printing
* All fonts support *underlining, italicizing, bold-facing, super/subscripting* and *9 pitches*
* FCC Certified
* Lifetime warranty

XETEC **Xetec, Inc.** 2804 Arnold Rd. Salina, KS 67401 (913) 827-0685

Commodore Product Potpourri

Hardware, Software & Firmware for your C-64, C-64C, C-128, AMIGA

ADD-A-COMPUTER

128 PLUS adds a new computer to your C-128. It looks like a **C-64** but it doesn't act like a **C-64.** True it loads **(up 5 times faster)** and runs **(almost twice as fast)** your favorite **C-64** programs. But it is a **C-64** with more features than the **C-128.** A **C-64** with all the keys on the **C-128** keyboard, including the numeric keypad, function keys (with better functions than the C-128), and most of the rest of top row of the keys. A **C-64** with 16 built **DOS/Wedge** commands. A **C-64** with a built in **PrintCable** driver for "Centronics parallel" printers. If you find a piece of software that doesn't work with **128 PLUS** a simple depression of the 40/80 key returns you to the old **C-64.** Don't delay any longer get a **C-128 PLUS** for your **C-128** or **C-128D** and discover a whole new world of **C-64** performance.

C-128 PLUS, C-128/C-128D **$39.95***
C-128 PLUS PrintCable, Parallel Printers **$19.95***
C-128 PLUS and PrintCable **$54.95***

Prevent and preclude premature pratfalls, by perplexed programming postulants

BASIC PROGRAM COMPILER

BLITZ! is the fastest, easiest to use, most popular, BASIC program compiler available for the **Commodore 128, C-64, and C-64C.** Your **BLITZ!** compiled programs will run from 5 to 20 times faster after you have **BLITZ** them. **BLITZ!** translates and reduces your BASIC programs in to a much, much faster code.

BLITZ! C-128, Disk **$59.95***
BLITZ! C-64, Disk **$49.95***

ASSEMBLER CARTRIDGE

If your C-64 programming needs have extended beyond BASIC, Skyles Electric works now offers **MIKRO,** a machine language assembler cartridge for the **Commodore 64/64C.** The **MIKRO** cartridge contains everything you need for machine language programming.

MIKRO Cartridge, C-64/C-64C . . **$49.95***

M.L. UTILITY TRIO

ZOOM is the perfect machine language monitor for the Commodore **C-64/C-64C,** with 23 editing commands and 11 disk commands. **TD** allows the full power of **VICTREE** to be applied to editing and writing machine language programs. **STP** is a ML Step-Wise Executor that is one of the nicest ML debuggers we have ever seen, for the **Commodore 64. ZOOM—TD—STP** the tremendous trio now in one package.

ZOOM-TD-STP, C-64/C-64C **$29.95***

DISK ALIGNMENT KIT

1541/1571 Disk Alignment Kit is the do-it yourselfer's delight. You furnish a voltmeter and 1 hours time and the **1541/1571 Disk Alignment Kit** furnishes; 1-Alignment Reference Disk, 2-test and alignment program disk, 3-video detector, 4-Instruction manuals, 5-1541 Maintenance Guide. All for less than the cost of a disk alignment.

1541/1541C/1571 Disk Alignment Kit **$29.95***

2 for 1 MONITOR CABLE/C-128

The**2 for 1 Monitor Cable** allows all composite video monitors to be used with the **Commodore 128** in all modes of operation. Don't throw out your present green or amber monitor, buy a

2 for 1 Monitor Cable for C-128 . . . . . **$24.95***

1541 FLASH!

The new Skyles Electric Works **1541 FLASH!** loads programs and files to your **Commodore 64/64C or Commodore 128** (64 mode) three times faster than an unenhanced Commodore 1541.

The **1541 FLASH! adds over 50 extra commands for the Commodore 64/64C/ 128** user.

1541 FLASH! C-64/C-64C & 1541 . **$69.95***
1541 FLASH! for two 1541s **$109.95***
C-128 FLASH! C-128 & 1541 . . . . . **$79.95***
C-128 FLASH! for two 1541s **$119.95***
SX-64 FLASH! SX-64 & 1541 . . . . **$69.95***
SX-64 FLASH! for two 1541s **$109.95***

BASIC PROGRAMMING AID

VICTREE is a BASIC programming aid cartridge for the VIC-20 and C-64/C-64C computer. **VICTREE** adds 42 extra commands for BASIC programming ease and full DOS control. **VICTREE** commands include CHAIN, EXECUTE, MERGE, SEND, USE, CONCAT, DOPEN, DCLOSE, RECORD, HEADER, COLLECT, BACKUP, COPY, APPEND, DSAVE, DLOAD, DIRECTORY, RENAME, SCRATCH, CATALOG, INITIALIZE, AUTO, DELETE, RENUMBER, MERGE, LCOPY, LMOVE, PRINT USING, FIND, CHANGE, PAGE, HELP, DUMP, and TRACE.

VICTREE 64 Cartridge, C-64/C-64C . **$49.95***
VICTREE 20 Cartridge, VIC-20 . . . . . **$29.95***

A powerful panoply of pertinent, potent, peripheral products

QUICKSILVER 128

QUICKSILVER 128 our premier IEEE-488 Interface for the **Commodore 128** is now in stock and even better than we had planned. **Quicksilver 128** offers an IEEE Interface for the **Commodore 128** in the C-128 mode (40 or 80 columns) and in the C-64 mode as well. **QUICKSILVER 128** will inter-connect your **Commodore 128** to Commodore SFD 1001, 2031, 2040, 3040, 4040, 8050, 8250, 9060, 9090 Disk Drives, and 2022, 2023, 4022, 4023 and 8023 Printers.

QUICKSILVER 128 C-128 . . . . . **$119.95***

A priceless programmers pallett of practical products and programs

IEEE Flash! 64

IEEE Flash! 64 our premier IEEE-488 Interface for the **Commodore 64** is now in stock and even more transparent (program compatible) than QUICKSILVER 64. **IEEE Flash! 64** will inter-connect your **Commodore 64** to Commodore SFD 1001, 2031, 2040, 3040, 4040, 8050, 8250, 9060, and 9090 Disk Drives, and 2022, 2023, 4022, 4023, and 8023 Printers.

IEEE Flash! 64 C-64/C-64C **$99.95***

2+1, 4+1 CARTRIDGE EXPANSION

Our 2+1 Cartridge Expansion gives you 2 vertical and 1 horizontal fully switchable cartridge ports. Our 4+1 Cartridge Expansion gives you 4 vertical and 1 horizontal fully switchable cartridge ports.

2+1 Cartridge Exp. C-64/C-64C or C-128 . . . . . **$39.95***
4+1 Cartridge Exp. C-64/C-64C or C-128 . . . . . **$69.95***

1571 FIX ROM

Relative File problems? "DEVICE NOT PRESENT" errors? I/O error 5 when using Superbase? Major problems when you have 2 or more files open? Painfully slow writing to the second side of the diskette? SAVE with replace problems? Takes forever to recognize a "Flippy" disk? If you have one or more of these problems with your **Commodore 1571 disk drive,** don't despair, don't trash your 1571, **do get a:**

1571 FIX ROM **$24.95***

The periodically puzzling, precarious, path to perspicacious program perfection and prowess

VIDEO DIGITIZER

The **VIDEO-DIGITIZER** module plugged into the user port of your **C-64/C-64C/C-128** allows you to digitize video signals, of whatever kind, show them on the screen, store or process them and print them out. The digitizer can be connected to any standard; video camera (b&w or color), VCR, or video disk player. The applications are unlimited. An accompany diskette contains programs to; Digitize a 256 by 256 pixel picture in 4 shades of gray, replace gray shades with colors, save complete 256 by 256 pixel picture, or 160 by 200 **Koala** format, printout on **Commodore 1515, 1525, 801, 802, 803, 1526, Epson, StarMicronix,** (and compatibles) **Canon PJ1080A, Okimate 20,** and **GP-700A** color printers.

All this is for an amazingly low price.

VIDEO-DIGITIZER, C-64/C-64C/C-128 . . . . . **$149.95***

BUSIDATA™

BUSIDATA features up to 1000 records per 1541 data disk, 2000 records per 1571 data disk, 6000 per SFD-1000 data disk, and over 20,000 records per SEW/JCT-1002 hard disk drive (see page 5). Each record can contain up to 254 characters and 20 fields of up to 79 characters per field. **BUSIDATA** features up to 20 keys and five levels of sorting on these on these keys. Also featured are easy to use menu driven data selection and handling features, that include RS-232 printer output.

BUSIDATA 64, C-64 Disk **$39.95***

A major manufacturers magnificent multitude, magnanimously merchandised for minimal money.

FAMILY TREE

Truly a program for the whole family, your wife's family, your parent's family, grandparent's family, and as many generations back as you wish. FAMILY TREE is the best genealogy program for the **C-64/C-64 Cor C-128.** Features unlimited genealogies, 4, 5, 6, generation pedigrees, family record sheet and much more.

FAMILY TREE, C-64/C-64C-1541 . . . . . **$49.95***
FAMILY TREE, C-64/C-64C/1541 (LDS) **$49.95***
FAMILY TREE, C-128/1541/1571 . . . . . **$49.95***

*Due to trade games being played by U.S. and Japan *all prices are subject to change without notice.* There is an additional $4.50 U.S. and Canada, $15.00 Europe and Asia, shipping charge per order. California

Skyles Electric Works

TO ORDER: Call 1-800-227-9998 or 1-415-965-1735 (CA) or write to:
For More Information: Send Stamped Self Addressed Envelope to:

231-E South Whisman Road, Mountain View, CA 94041

TWENTY TIMES THE POWER!

CONFIDENCE LEVEL IS HIGH

Why purchase only 1 thoroughbred handicapping strategy when you can have the POWER of the 20 most popular handicapping strategies available?

A proven computer program, designed by an M.B.A. of Finance, combines improved variations of the 20 most popular handicapping strategies into one easy program. This POWERFUL program called Multi-Strats can analyze a race using 20 strategies in a fraction of the time you analyze a race using just 1 strategy.

Simply type in the answers to the program questions. All the info is in the Daily Racing Form. The results of the 20 strategies will automatically appear on your screen or printer. Multi-Strats then tabulates the 20 strategy totals to give you an ultimate number for each horse.

The Statistical and Actual CONFIDENCE LEVEL is HIGH when 12 or more strategies select the same horse to Win!

Multi-Strats package includes: ★ 20 Strategies ★ 50 Page Book (with money management) ★ 5¼" or 3½" disk or tape ★ Hotline Phone ★ First Class delivery ★ BONUS #1 Video Tutorial (VHS or Beta) ★ BONUS #2 Lottery Program ★ BONUS #3 Pick 6-10 Horse Program ★ BONUS #4 Free Las Vegas Trip eligibility ★ All for $89.95 (Add $3 S & H) with a 10 day money back guarantee.

Order by Check, Visa, MC. AMEX, or C.O.D. to:
Banana Software, Inc. Dept. SA. 6531 Park Avenue, Kent, OH 44240.

ORDERS (216) 673-6969 (24 hrs.)
INQUIRIES (216) 673-6167 (recording)

ALL MODELS

IBM COMMODORE APPLE
RADIO SHACK ATARI

We Do Windows...Quickly!

C-MORE

An Operating System for the Commodore 64.

- **USE YOUR COMMODORE LIKE A PC!**
- Let C-More teach you all about business computing! Control multiple applications in windows. Word Processing, Spreadsheet, Database, Scientific Calculator, Disk Utility and Comparative-Buyer programs are all included!
- Comprehensive 450-page manual provides tutorials, step-by-step instructions, examples and illustrations, for any level user!
- **WRITE COMMODORE BASIC PROGRAMS FOR C-MORE!!**

1-800-628-2828 ext. 790

VISA Visa and Mastercard Accepted MasterCard
or mail $49.95 plus $4.50 shipping & handling
($6.00 shipping in Canada)
(Georgia residents add $2.00 sales tax)
C-More Products, P.O. Box 81548 Chamblee, GA 30366
Please allow 4-6 weeks for delivery.
"Commodore" is a trademark of Commodore Electronics, Ltd.

C-64™ • VIC™ • SX-64™ • C-128™ • Plus 4™ • C-16™ • B-128™ • PET™ • CBM™

One disk, 25 business programs, $19.95

The **Intelligent Software Package** is the one product for your Commodore that can take care of all your data processing needs.
Customers write: *"What a bargain!"*
"I am amazed at all there is in these programs."
"This letter is to tell you that your package is absolutely the best I have found."
"At last! Something to make my computer do real work."
There are no hidden fees for shipping or documentation, and no clubs to join. The package is not public domain software, and is sold only direct to customers by mail: it supports all available printers, and will run on any Commodore computer (except Amiga) with a minimum of 10k RAM, including the C-128 in C-128 mode.

What you get when you order the Package:

Database—A complete database manager. All fields completely user-definable. Can be used for any number of tasks, including accounting, checkbook and tax records, mailing lists, inventory control, catalog maintenance, or as an electronic rolodex. A customer writes: *"I am especially impressed with Database, and have used it to replace a half-dozen other 'database'-type programs I had been using."*
Word Processor—A full-featured menu-driven word processor. Allows full control over margins, spacing, paging, indentation, and justification. *"Highly recommended."* — Midnite Software Gazette. *"Provides good basic features."* — Compute's Gazette.
Copycalc—An electronic spreadsheet. *"Excellent program for budgeting, estimating, or any math-oriented use . . . well worth the money. Highly recommended."* — Midnite Software Gazette.
ReportGen—creates form letters, mailing lables, etc.
ReportMerge—creates statements invoices.
Baseball Stats—compiles team batting statistics.
Index—indexes W/P's text files.
WPConvert—converts files to other WP formats.
DBMerge—facilitates relational D/B applications.
DBStat, DBStat2—analyze D/B files.
ASCII—converts text files into program files.
Checkbook—reconciles checkbook.
Inventory—Maintains inventory records.
Paper Route—A/R for paper route.
Loan Analysis—computes finance terms, prints schedules.
Breakeven—computes breakeven analysis.
Depreciation—creates depreciation schedules.
Labeler—creates labels.
File Copier—copies sequential, program files.
Correlation—calculates statistical correlation.
Also other Database and Word Processor utilities.

To order, send name, address, and $19.95 to address below. Please specify regular (1541/1571/2040/4040/2031) disk, 8050 disk, or cassette (cassette not available for Plus 4 or C-16). Add $3 for COD orders; credit cards not accepted. Calif. residents add 6%. No personal checks from outside USA. A sampling of program output is available for $1. **Tear this ad out and keep it handy!**

Intelligent Software
Quality Software since 1982

Box A Dept. G-0
San Anselmo, CA 94960
(415) 457-6153

NEW VERSION 3.0 FOR C64 & C128 IN 128 MODE

THE MIRROR

DISK COPIER

$24.95

NO FINER OR MORE ADVANCED ARCHIVAL COPIER AVAILABLE AT ANY PRICE.
EASY TO USE. DOES NOT CAUSE DRIVE HEAD TO KNOCK.
COPIES UP TO 41 TRACKS.
PERIODIC UPDATE POLICY.
AUTOMATICALLY MAKES BACK-UP COPIES FROM VIRTUALLY ALL PROTECTED SOFTWARE.
NIBBLES, HALF TRACKS, COPIES EXTRA SECTORS AND EXTRA TRACKS.
REPRODUCES ALL DISK ERRORS AUTOMATICALLY.
FAST, COPIES FULL DISK IN AS LITTLE AS 4-7 MINS. EVEN COPIES ITSELF

WE COPY MORE!
MASTERCARD, VISA, M.O. OR CHECK OK
+ $3 SHIPPING & HANDLING
C.O.D. OR FOREIGN ORDERS ADD $2
CALIF. ORDERS ADD 6% SALES TAX
— WRITE OR CALL —

Compumed

VISA
(408) 758-2436
P.O. BOX 6939
SALINAS, CA 93912
FOR COMMODORE 64 AND 1541 DRIVE
OR COMMODORE 128 AND 1571 DRIVE

MONTGOMERY GRANT

115 Nassau St. NY., NY. 10038
Bet. Beekman & Ann Sts.(212)732–4500
Open Mon–Fri, 8:30–6:30/Sat, 9:30–6
Sun, 9:30–5:30

Penn. Station, Amtrack Level Beneath
Madison Sq. Garden,NY.,NY. 10001
(212)594–7140 Open Mon–Wed, 8:30–8/Thurs
& Fri,8:30–9/Sat & Sun, 10–7

FOR ORDERS AND INFORMATION CALL TOLL FREE
OPEN 7 DAYS EVERY WEEK FOR ORDERS
1(800)345–7059
1(800)345–7058

IN NEW YORK STATE CALL
(212)594–7140
FOR CUSTOMER SERVICE CALL
(718)965–8686 9am-4pm Mon-Fri

NO SURCHARGE FOR CREDIT CARD ORDERS

WE INVITE CORPORATE & EDUCATIONAL CUSTOMERS

commodore C64C

With Geos Program!
$149.95

commodore C128

$208.95
NEW C–128/D WITH BUILT–IN DISK DRIVE **$439**

Commodore AMIGA 500

- 68000 Processor
- 512k Ram Expandable to 9MB
- Graphics Processor

IN STOCK

AMIGA PERIPHERALS
A–501 512K EXPANSION
A–1010 3.5" FLOPPY DRIVE
A–1020T 5.25" DISK DRIVE with TRANSFORMER
A–1080 RGB COLOR MONITOR
A–1300 GENLOCK
A–1060 SIDECAR
THESE AND OTHER PERIPHERALS IN STOCK
WE WILL BEAT ANY PRICE
AMIGA 1000 w/ 512K $699
AMIGA 2000.....CALL

commodore

C64C COLOR PACKAGE

COMMODORE C–64C COMPUTER
COMMODORE 1541/C DISK DRIVE
COMMODORE COLOR PRINTER
COLOR MONITOR
GEOS SOFTWARE PROGRAM

$478

COLOR MONITOR ADD $90

commodore

C64C COMPLETE PACKAGE

COMMODORE C–64/C COMPUTER
COMMODORE 1541 DISK DRIVE
COMPUTER PRINTER
12" MONITOR
GEOS SOFTWARE PROGRAM

$329

commodore

C128 COMPLETE PACKAGE

COMMODORE 128 COMPUTER
COMMODORE 1541 DISK DRIVE
12" MONITOR
COMPUTER PRINTER

$439
TO SUBSTITUTE 1571 FOR 1541 – ADD $60

commodore

C128 DELUXE PACKAGE

COMMODORE 128 COMPUTER
COMMODORE 1571 DISK DRIVE
COMMODORE 1902 COLOR MONITOR
COMMODORE 1515 80 COLUMN PRINTER

$679

EPSON EQUITY II

IBM PC/XT COMPATIBLE PACKAGE

Equity II Computer · 640K RAM
Power · 360K Disk Drive · 10 MHz
Serial/Parallel Ports ·12" High
Resolution Monitor · Keyboard

$899
Same Package with 20MB Hard Drive **$1169**

BLUE CHIP

IBM PC/XT COMPATIBLE PRINTER PACKAGE

- Blue Chip Keyboard · 512K RAM Expandable to 640K · 6 Expansion Slots
- All Hook–up Cables and Adaptors · Brother 80 Column Printer · 12" Monitor
- Package of 10 Diskettes optional·20MB Hard Drive

$479
Same Package with 20MB Hard Drive **$749**

apple PACKAGES

Apple IIC or IIE Computer 5.25" Drive 12" Monitor All Hook–up Cables and Adaptors Package of 10 Diskettes

APPLE IIC PACKAGE	APPLE IIE PACKAGE
$669	**$869**

commodore PC10–1

IBM PC/XT COMPATIBLE PACKAGE

- PC10–1 Computer
- 512K Expandable to 640K
- 360K Disk Drive
- Enhanced Keyboard
- Serial & Parallel Ports
- 12" Monitor
- All Hook–up Cables & Adaptors
- Package of 10 Diskettes

$519
Same Package with 20MB Hard Drive $769
COMMODORE PC–10/2 640K COMPUTER w/2 360K DRIVES & ABOVE PACKAGE **$619**

COMPUTER PRINTERS

commodore

MPS–803C PRINTER **$129**
MPS–1000 PRINTER **$169**
MPS–1200 PRINTER **$209**
DPS–1101 DAISY WHEEL PRINTER **$169**

EPSON

FX–86E	$309.95
FX–286E	$429.95
LQ–800	$399.95
LQ–1000	$559.95
EX–1000	$489.95

Panasonic

1091I–II	$189.95
1092	$285.00

OKIDATA

OKIDATA–120	$199.95
OKIMATE–20 W/PLUG'N'PRINT	$189.95

star

NX–10	$149.95	NR–15	$405.95
NX–10C	$169.95	NB–15	$689.95
NX–15	$289.95	NB–2410	$399.95
ND–15	$369.95	NB–2415	$539.95

PERIPHERALS

commodore

1902 RGB COLOR MONITOR **$214.95**
1802 COLOR MONITOR **$169.95**
2002 COLOR MONITOR **$239.95**
THOMPSON RGB COLOR MONITOR **$289.95**

DISK DRIVES

1541/C DISK DRIVE **$159.95**
1571 DISK DRIVE **$198.95**
1581 DISK DRIVE **$199.95**
1351 MOUSE **$39.95**

#1700 128K EXPANSION MODULE	$99.95
#1750 512K EXPANSION MODULE	$169.95
#1764 EXPANSION MODULE	$129.95
#1670 AUTOMODEM	$129.95
XETEC JUNIOR INTERFACE	$34.95
XETEC SENIOR INTERFACE	$54.95
C–128 POWER SUPPLY	$39.95
C64/C64–C POWER SUPPLY	$29.95

20MB HARD DRIVES FOR C–64/C ..$769 C–128..$849

NO SURCHARGE FOR CREDIT CARD ORDERS

Certified check, Bank check, Mastercard, Visa, Am–Ex, Diner's Club, Carte–Blanche, Discover Card and C.O.D.s accepted. No additional surcharge for credit card orders. Non–certified checks must wait 4–6 weeks clearance. Money orders are non–certified checks. N.Y. residents add applicable sales tax. Prices and availability subject to change without notice. Not responsible for typographic errors. Return of defective merchandise must have prior return authorization number, or returns will not be accepted. IBM PC/XT are registered trademarks of International Business Machine Corp. All orders can be shipped Air Express–call for details.

MADE IN U.S.A.
5¼" DISKETTES

DSDD
33¢
each

DSHD
89¢
each

• Lifetime Warranty
• Error Free

• Sturdy Blank PVC Jacket
• With ID Label
• With Write Protect Tabs
• With Envelopes
• In Factory Sealed Poly Packs
SOLD IN LOTS OF 100

3½" DISKETTES
(UNBRANDED)
SALE 99¢ each
SOLD IN LOTS OF 50

S & H: $4.00, FIRST 100 OR FEWER DISKS;
$3.00, EACH SUCCEEDING 100 OR FEWER DISKETTES.

MINIMUM ORDER: $25.00. S&H: Continental USA. Foreign Orders, APO/FPO, please call. MI residents add 4% tax. C.O.D. add $4.00; payment with cash, certified check or money order. Prices subject to change. Hours: 8:30 AM—7:00 PM ET.

Call for FREE CATALOG

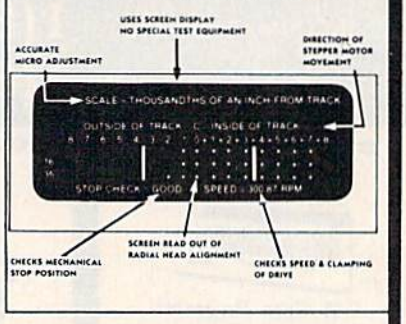
COD

Precision Data Products™
P.O. Box 8367, Grand Rapids, MI 49518
(616) 452-3457 • FAX: (616) 452-4914
Michigan 1-800-632-2468
Outside Michigan 1-800-258-0028

"I Saved Time & Money with PHYSICAL EXAM"

Disk drive read errors are a frustrating waste of time! I use a data base to keep records for our club. Last week I experienced read errors on my disk drive. Luckily I have a 1541 Physical Exam program. The alignment test confirmed what I had suspected, my drive was out of alignment. I am happy to report that I aligned my drive MYSELF. I avoided the wait for repair and paid a fraction of the cost.

1541 Physical Exam Sample Screen



Package includes: • True digital alignment disk with offset tracks. • Mechanical Stop Test • Speed Test • Illustrated manual with instructions for performing alignment, adjusting speed and stop position. • Print test results for future reference.

Physical Exam is available for these drives: 1541, 1571, 8050, 8250, 4040, SFD 1001. *Please Specify Drive!* **$39.95** EA. + SHIP.

See Reviews in: Run Special Issue #3, 1/87, p.83; **Info #11**, Aug/Sept 86, p.46 **Midnite Gazette**, April 1986, p. 19.

Cardinal Software
14840 Build America Dr.
Woodbridge, VA 22191
Info: (703) 491-6494

Order Toll Free 10 - 4 MON-SAT
800 762-5645

UNLEASH THE DATA ACQUISITION AND CONTROL POWER OF YOUR COMMODORE C64 OR C128.
We have the answers to all your control needs.

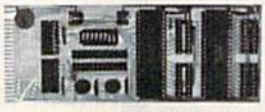
NEW! 80-LINE SIMPLIFIED DIGITAL I/O BOARD

Create your own autostart dedicated controller without relying on disk drive.

- Socket for standard ROM cartridge.
- 40 separate buffered digital output lines can each directly switch 50 volts at 500 mA.
- 40 separate digital input lines. (TTL).
- I/O lines controlled through simple memory mapped ports each accessed via a single statement in Basic. No interface could be easier to use. A total of ten 8-bit ports.
- Included M.L. driver program optionally called as a subroutine for fast convenient access to individual I/O lines from Basic.
- Plugs into computer's expansion port. For both C64 & C128. I/O connections are through a pair of 50-pin professional type strip headers.
- Order Model SS100 Plus. **Only $119!** Shipping paid USA. Includes extensive documentation and program disk. Each additional board $109.

We take pride in our interface board documentation and software support, which is available separately for examination. Credit against first order.
SS100 Plus, $20. 64IF22 & ADC0816, $30.

OUR ORIGINAL ULTIMATE INTERFACE



- Universally applicable dual 6522 Versatile Interface Adapter (VIA) board.
- Industrial control and monitoring. Great for laboratory data acquisition and instrumentation applications.
- Intelligently control almost any device.
- Perform automated testing.
- Easy to program yet extremely powerful.
- Easily interfaced to high-perfomance A/D and D/A converters.
- Four 8-bit fully bidirectional I/O ports & eight handshake lines. Four 16-bit timer/counters. Full IRQ interrupt capability. Expandable to four boards.

Order Model 64IF22. $169 postpaid USA. Includes extensive documentation and programs on disk. Each additional board $149. Quantity pricing available. For both C64 and C128.

A/D CONVERSION MODULE

Fast. 16-channel. 8-bit. Requires above. Leaves all VIA ports available. For both C64 and C128. Order Model 64IF/ADC0816. Only $69.

SERIOUS ABOUT PROGRAMMING?

SYMBOL MASTER MULTI-PASS SYMBOLIC DISASSEMBLER. Learn to program like the experts! Adapt existing programs to your needs! Disassembles any 6502/6510/undoc/65C02/8502 machine code program into beautiful source. Outputs source code files to disk fully compatible with your MAE, PAL, CBM, Develop-64, LADS, Merlin or Panther assembler, ready for re-assembly and editing. Includes both C64 & C128 native mode versions. 100% machine code and extremely fast. 63-page manual. The original and best is now even better with Version 2.1! Advanced and sophisticated features far too numerous to detail here. $49.95 postpaid USA.

C64 SOURCE CODE. Most complete available reconstructed, extensively commented and cross-referenced assembly language source code for Basic and Kernal ROMs, all 16K. In book form, 242 pages. $29.95 postpaid USA.

PTD-6510 SYMBOLIC DEBUGGER for C64. An extremely powerful tool with capabilities far beyond a machine-language monitor. 100-page manual. Essential for assembly-language programmers. $49.95 postpaid USA.

MAE64 version 5.0. Fully professional 6502/65C02 macro editor/assembler. 80-page manual. $29.95 postpaid USA.

NEW ADDRESS!

SCHNEDLER SYSTEMS
Dept. G12, 25 Eastwood Road, P.O. Box 5964
Asheville, North Carolina 28813 Telephone (704) 274-4646

NEW ADDRESS!

ABBY'S DISCOUNT SOFTWARE

ABBY'S HOLIDAY SPECIALS

COMMODORE 64/128

AN ABBY'S EXCLUSIVE!!

An Actual Screen

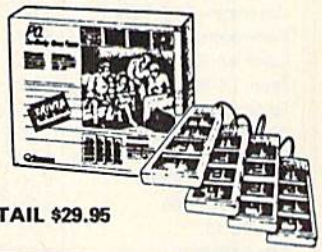
CHRISTMAS CAROLS & PARTY SONGS
$5.95 ea. or Both For $10.00

John Henry Software®
QUALITY IS OUR STRENGTH

Suggested Retail $15.95 ea.

Suncom

P.Q. PARTY QUIZ ONLY $12.95



SUGGESTED RETAIL $29.95

NASHUA DISKS

DS/DD 5¼" W/Sleeves
$39.00 a Hundred or
$33.00 a Hundred In
Quantities of a Thousand

Buy Four - Get One FREE

INFOCOM
COMMODORE
& MASTERTRONICS

Zork II	$4.99	Finders Keepers	$4.99
Zork III	4.99	Vegas Jackpot	4.99
Suspended	4.99	1985 - The Day After	4.99
Starcross	4.99	Ant Attack	4.99
Deadline	4.99	Challenger	4.99
Captive	4.99	Spooks	4.99

MEMOREX DISKS

20 - SS/DD 5¼" Disks
With File Box
Holds 50 Disks
Only. . . . $12.95

ELECTRONIC ARTS

Amnesia	$29.95
Dungeon Runners	24.95
Instant Music	24.95
Patton vs. Rommel	24.95
Strike Fleet	24.95
Delta Patrol	16.95
Sanxion	16.95
Yeagar's A.F.S.	29.00

SSI

Phantasie III	$29.00
Realms of Darkness	29.00
Shiloh	29.00
Roadwar Europa	29.00

ACCESS

Echelon	$25.95
Leader Board	25.95
L.B. Tournament #1	12.95
World Class L.B.	25.95
W.C. Famous Courses #I & II ea.	12.95

MICROPROSE

Stealth Fighter	$27.95
Pirates	26.49
Gunship	23.49
Airborne Ranger	25.95
Top Gunner Series	16.49

CENTRAL POINT

Copy II	$29.00

XETEC, INC.

Fontmaster II	$33.95
Fontmaster 128	39.95

RIBBONS

Commodore 1525	$7.50
Commodore 1526/802	7.00
Commodore MPS-801	7.50
Commodore MPS-803	9.00
Epson MX/FX/RX-80 ea.	5.00
Panasonic 1080/1091/ 1092 ea.	8.00
Star Gemini Black	2.50
Star Gemini Color*	2.50
*Please State Choice of Color	
Star NX-10, NP-10, NL-10 ea.	8.00
Okimate 120	6.50
Okimate 10/20 Black	4.50
Okimate 10/20 Color	5.00

ACCESSORIES

VIC 1750 Expansion	CALL
VIC 1764 Expansion	CALL
VIC 1351 Mouse	CALL
Avatex Modems	CALL
Xetec Super Graphics	$59.00
Xetec Super Graphics Jr.	35.95
Wico Boss Joystick	15.00
Epyx 500XJ Joystick	15.00
Disk Notchers	4.50
American Mouse House	5.95
American Mouse Mats	7.50

DUST COVERS

C-128 Computer	$7.00
Vic 20/64 Computer	7.00
1571 Disk Drive	7.00
1541 Disk Drive	7.00
1525 Printer	9.00
1526 Printer	9.00
MPS 1000 W or w/O Tractor ea.	9.00
MPS 801/802 Printer ea.	9.00
MPS 803 W or W/O Tractor ea.	7.00

BOOKS

1541 Repair & Maintenance	$15.00
Anatomy of the C-64	15.00
Anatomy of the 1541	15.00
GEOS Inside & Out	15.00
GEOS Tricks & Tips	15.00
Peeks & Pokes For the C-64	12.00
Tricks & Tips For the C-64	15.00
1571 Internals	15.00
C-128 Basic 7.0 Internals	18.95
C-128 Tricks & Tips	15.00
Peeks & Pokes for C-128	12.50
C-128 CP/M User's Guide	15.00
C-128 Internals	15.00

MINDSCAPE

Gauntlet	$26.00
Infiltrator II	26.00
Paperboy	26.00
S.D.I.	26.00
Super Star Soccer	26.00
Into The Eagle's Nest	22.95
Bop 'N Rumble	22.95
Defender of the Crown	23.49

ACTIVISION

Gee Bee Air Rally	$22.95
Maniac Mansion	25.95
Post Cards	22.95
The Last Ninja	25.95

DATA EAST

Break Thru	$23.49
Ikari Warrior	23.49
Karate Champ	13.49
Kung Fu Master	13.49
Tag Team Wrestling	23.49

DIGITAL SOLUTIONS, INC.

Super Pack II	$65.95
Pocket Filer II	39.95
Pocket Planner II	39.95
Pocker Writer II	39.95
Pocket Dictionary	9.95

ROGER WAGNER

Merlin 64 or 128	CALL

ACTIONSOFT

Thunder Chopper	$19.95
Up Periscope	19.95

CALL ON THESE AND OTHER PRODUCTS. WE CARRY A COMPLETE LINE OF SOFTWARE AND ACCESSORIES INCLUDING PRINTERS.

ALL TITLES ON DISK UNLESS MARKED (R) FOR ROM CARTRIDGE & (C) FOR CASSETTE TAPE

Order Line
1-800-282-0333
ORDERS ONLY! Sales Personnel Do Not Have Information on Previous Orders or Product Specs.

WE CHECK FOR STOLEN CHARGE CARDS
M-F 10 a.m.-8 p.m.; Sat. 10-3 ET
37 S. Broad Street, Fairborn, OH 45324

Customer Service & Ohio Residents
1-513-879-9699

DISCOVER

MasterCard VISA

SOFTWARE ONLY — Prepaid orders over $50 receive free shipping via UPS in continental U.S. Please add $2 orders under $50. HARDWARE and all orders requiring shipment via U.S. Post Office are subject to additional freight charges. C.O.D. orders under $100.00 accepted - add $5. Charge card orders add $2 service charge. Ohio residents add 6% sales tax. Personal checks require a three-week waiting period. No waiting when paid by credit card, certified check or money order. All items subject to availability and price change. PLEASE CITE AD NUMBER WHEN ORDERING. ALL RETURNS MUST BE ACCOMPANIED BY AN AUTHORIZATION NUMBER.

AD #G-127

COLOR PRINTER RIBBONS

COLORS: RED BROWN BLUE PURPLE GREEN YELLOW

Ribbons Price Each	Black	Color	Heat Transfer
Apple Imagewriter I/II	3.95	4.95	6.50
Brother M1009	4.95	5.95	7.00
Citizen 120D	5.00	—	—
Commodore MPS 801	4.15	4.75	5.75
Commodore MPS 802	5.75	6.75	—
Commodore MPS 803	4.95	5.95	7.00
Commodore MPS 1000	3.60	4.25	6.75
Commodore MPS 1200	5.00	—	—
Epson AP 80	5.25	6.50	7.95
Epson LX 80/90	3.60	4.25	6.75
Epson MX/FX/RX 80	3.75	4.25	6.75
Okidata 82/92/93	1.75	2.25	4.25
Okidata 182/192	6.00	9.00	—
Panasonic KX-P1090	6.50	9.75	—
Seikosha SP 800	5.25	6.50	7.95
Star SG 10	1.75	2.25	4.50
Star NX10/NL10	5.00	6.00	7.95

T-Shirt Ribbons (Heat Transfer)—
Call For Price & Availability.

For ribbons not listed above, call for price and availability. Price and specifications are subject to change without notice.
Minimum order is $25.00. Shipping & handling $3.50. UPS Ground. Add $2.00 C.O.D. additional. Illinois residents add 6.25% tax. MasterCard and Visa accepted..

RENCO COMPUTER PRINTER SUPPLIES
P.O. Box 475, Manteno, IL 60950 U.S.A.
1-800-522-6922 815-468-8081

DISKART — READY-TO-USE GEOS GRAPHICS DISKS

Attention GEOS users! Tired of going through the cost and expense of converting other graphics to the GEOS format? Here are disks of ORIGINAL graphics that take advantage of the great GEOS operating system! Created with GEOS for GEOS, each of these disks provide a selection of graphics that will tickle the eye (and the wallet).

DISKART 1 (assorted)
Graphic Goodies 1 · Weather Stuff 1 · Graphic Goodies 2
Holidays 1 · GEOpaint Tips 1 · GEOpaint Tips 2

DISKART 2 (assorted)
Graphic Goodies 3 · U.S. Map 1 · Little Guys 1
Workdisk Labels · Holidays 2 · GEOpaint Tips 1
Musical Stuff 1

DISKART 3 (wheels and wings)
Vehicles 1 · Vehicles 2 · DC-3 Airliner
PORSCHE 959 · F4 Phantom · Warbirds 1
Tin Lizzies · Nieuport 17

DISKART 4 (assorted)
Little Guys 2 · Ovals/Blocks/etc. · Foodstuff 1
C64 and Periphs · Tools 1 · Spring/Summer stuff

DISKART 5 (assorted)
Make-A-Face · Drafting Equip · Vehicles 3
Banners 1 · Flowchart Symbols · Little Women 1
Little Women 2 · Houses 1

DISKFORMS (5 different, blank, forms, plus 3 ready-to-print forms)
INSTRUCTIONS · Lined Paper · Delivery Receipt
Blankform 1 · Inventory Form · Bank Deposit Form
Blankform 2 · Blankform 3 · GEOpaint Tips 1
Blankform 4 · Blankform 5

MUSI-KIT (create professional-looking sheet music)
Musi-Kit Info · Piano Title · Piano Staff
Musi-Kit · Single Title · Single Staff
Large Instruments · Sample Sheet

To Order,
Send **$8.50** for each disk (U.S. Funds)
(Check or M.O. only) (foreign order add $1.75 per disk)
CA res add 6.5 / tax

TO: ***Those Designers***
3330 Lewis Avenue, Signal Hill, CA 90807

GEOS is a registered trademark of Berkeley Softworks

Can Your Computer Make YOU $1,000,000?

WITH LOTTERY PC YOUR NEXT TICKET COULD BE WORTH MILLIONS!

LOTTERY uses the raw power and storage of your computer to determine and refine the number selection methods that will win the various lottery games you play. Don't be limited to the one or two methods that other programs use, they might not work in your state. There is no better system available!

Join the growing list of winners using our system.

SPECIFY:
Lottery 64(C64/128) • Lottery +4(Plus/4)
Lottery ST (Atari) • Lottery PC
IBM PC/XT/AT and compatibles

Commodore64/128 & Plus/4 are registered trademarks of Commodore Int.
IBM PC/XT/AT are registered trademarks of International Business Machines Inc.
Atari ST is a registered trademark of Atari Corp.

To order, send $29.95 for each plus $3.00 postage & handling per order to:
(Illinois residents add 6% sales tax)
(Orders outside North America add $3.00)

C.O.D. orders call:
(312) 566-4647

Superior Micro Systems, Inc.
P.O. Box 713 • Wheeling IL 60090

COMMODORE 64 SOFTWARE ONLY $5.00/DISK

- ☐ 001 LUSCHER COLOR TEST
- ☐ 011 DISK FILE UTILITIES
- ☐ 027 MUSIC AND SOUND
- ☐ 035 BEST OF TPUG #1
- ☐ 065 BEST OF COMMUNICATION
- ☐ 066 BEST OF UTILITIES
- ☐ 067 BEST OF GAMES
- ☐ 068 BEST OF EDUCATION
- ☐ 085 C64 SPACE GAMES
- ☐ 091 ADVENTURE
- ☐ 096 NEW STUFF
- ☐ 102 BEST GAMES OF ENGLAND
- ☐ 105 ARTIST SKETCHBOOK
- ☐ 106 GREAT AMERICAN NOVELISTS
- ☐ 107 PHONE CONNECTIONS
- ☐ 108 SPACE WARS
- ☐ 109 DUNGEONS & DRAGONS
- ☐ 110 HOME ORCHESTRA
- ☐ 111 JUKE BOX
- ☐ 112 EINSTEIN'S FAVORITES
- ☐ 113 PONZO'S TUTOR
- ☐ 114 ELECTRONIC SECRETARY

18¢ DISKETTES CALL FOR DETAILS

Add $4 shipping and handling per order.
CA residents add 6.5% sales tax
For free 56 page catalog
Call toll free **800-431-6249** In CA **1-800-654-7955**

Amount enclosed $ ☐ Check ☐ VISA ☐ MasterCard
Card No.
Signature Exp. Date
Phone ( )
Name
Address
City State Zip

BLACKSHIP
COMPUTER SUPPLY
385 Oyster Point Blvd. #10
South San Francisco, CA 94080

DUST COVERS

SATISFACTION GUARANTEED

★ CUSTOM MADE TO FIT
★ HEAVY 32-oz. VINYL ANTI-STATIC
★ EXTENDS EQUIPMENT LIFE
★ Choice of Colors Light Tan or Brown

COMPUTERS

C-64/Plus 4/C-64C	8.00
C-128	13.00
Datassette (C2N)	5.00
Amiga 1000	13.00
(W/Amiga Mon. Stacked)	28.00
Keyboard only	7.00
Atari 800XL, 130XE	10.00
Atari 520 ST	14.00
IBM PC/XT	28.00
IBM 5051 Keyboard	8.00
(Dimensions Required for IBM Clones)	

DISK DRIVES

C-1541, C-1571	8.00
Amiga 3½" D/Drv	8.00
Amiga 5¼" D/Drv	9.00
Indust GT, MSD SD-1	8.00
MSD SD-2	10.00
Enhancer 2000	8.00
FSD-1	8.00
Atari 1050	8.00

PRINTERS

C-1525/MPS 801	10.00
C-1526/MPS 802	13.00
C-MPS/803, C-1520	8.00
Panasonic 1090/91	13.00
Okidata 120/192	13.00
Okimate 10/20	8.00
Epson MX/FX/RX80	13.00
Epson LX80/C-1000	13.00

PRINTERS

Seikosha SP-1000	13.00
Comrex 220	13.00
C'Itoh 8510	13.00
Juki 5510	13.00
Imagewriter	13.00
Epson JX 80	13.00
Epson FX 85/185	13.00
Okidata 92	13.00
Citizen MSP 10	13.00
C/DPS 1101	16.00
Gemini 10 & Star 10's	13.00
Gemini 15 & Star 15's	16.00
Atari 1027	13.00

MONITORS

Atari SC 1224RGB	19.00
C-1702, BMC Color	16.00
C-1902/Amiga	19.00
Amdek 500-700	19.00
CM-141 (C-1802)	19.00
C-1902A/Magnvx 40	19.00
NEC (State Model)	19.00
Magnavox 80 RGB	19.00
Princeton (State Model	19.00
Thompson CM 365-66	19.00
Taxan (State Model)	19.00
Sakata SC-100	19.00
Zenith (State Model)	19.00
VIDEO RECORDERS	**13.00**
State Make & Model Dimensions required including clock cut-out	

Order by stating MAKE, MODEL and COLOR CHOICE - TAN or BROWN with check or money order plus $1.50 per item ($4.50 max.) shipping and handling. Calif. Res. Include 6½ + local tax. APO, 2.00/item, Foreign 3.00/item

SPECIAL COVERS WILL BE MADE TO YOUR DIMENSIONS. SEND YOUR REQUIREMENTS FOR OUR LOW PRICE QUOTES.

Crown Custom Covers
24621 PAIGE CIRCLE DEPT. A
LAGUNA HILLS, CA 92653
(714) 472-6362

THE SOFT 64 & 128 GROUP

NEW!
PRESENTING...
EXPLODE! V3.0
SUPER CARTRIDGE

EXPLODE! V3.0 is the easiest to use, most powerful SUPER CARTRIDGE one can own. **EXPLODE! V3.0** will work with the FSD-2, 1541, 1571, 1581, SX-64, 64-C, C-64/128. **EXPLODE! V3.0** will NOT interfere with program operations. **EXPLODE! V3.0** will move your Commodore (tm) into the fast lane with the power and features most asked for by Commodore users...
FEATURES LIKE:

(1) The **WORLD'S FASTEST!** most **INTELLIGENT** cartridge based fastloader. Speed comparison below is based on a file size of 145 blocks, with an inter-leave of 6. The same inter-leave used by the 1571.

Super Snapshot's time	41 secs
Final Cartridge's time	39 secs
EPYX Fastloader's time	39 secs
MACH 5 Fastloader's time	39 secs
Normal 1541-71 loadtime	1 min. 41 secs
EXPLODE! V3.0 loadtime	13 secs

(2) Not only can **EXPLODE! V3.0** capture ALL STANDARD HI-RES SCREENS and save to disk! **EXPLODE! V3.0** can also CONVERT ANY TEXT SCREEN and many CUSTOM CHARACTER HI-RES and SPLIT SCREENS into standard Doodle (tm) or Koala (tm) screens.
(3) **EXPLODE! V3.0** comes with a BUILT-IN SECURED MEMO PAD with a full save, print and redisplay feature.
(4) **EXPLODE! V3.0** can load, open, display to screen and print ANY! SEQ. or PRG. file DIRECTLY from a DISK DIRECTORY with only 3 KEYSTROKES! No need to LOAD UP a WORD PROCESSOR! or even type a file name.
(5) **EXPLODE! V3.0** can load, print and RE-DISPLAY DISK BASED HI-RES files with or without COLOR as POSITIVES or NEGATIVES.
(6) **EXPLODE! V3.0** comes with a SUPER side show display program, which can show a MIXTURE of DOODLE, KOALA or TEXT FILES! together on ONE DISK.
(7) **EXPLODE! V3.0** comes with a FULLY DETAILED MANUAL and **FREE UTILITY DISK**, that's informative for both the average user and the technically inquisitive.
(8) **EXPLODE! V3.0** comes with a VIRTURAL RESET. This reset will allow you to STOP any program in its tracks! No more turning your computer off and on to clear out a program. Only **EXPLODE! V3.0** can give you all the above and more! Don't spend your hard earned money on cartridges which give you features you may never use. Or options that only work sometimes! Most Commodore users will find a SEQ or PRG. FILE READER much more useful than say: a MACHINE LANGUAGE MONITOR! And if you think the above looks good! The best news of all is the price. The following prices were in effect as of 9/15/87:

Super Snapshot $54.95
Final Cartridge $54.95
EXPLODE! V3.0 still only $29.95 plus $1.50 S/H or $3.04 for C.O.D.

Oh! almost forgot to tell you, **EXPLODE! V3.0** also comes with DRIVE #8 SUPPORT, D.O.S. Wedge, UN-NEW command for basic, One keystroke disk directory listing, Full screen driven menu, Cartridge OFF feature, Border color indicator, Infinitely repeating keys and many other features. When calling or writing don't forget to ask about our new ON TARGET 1541-71 ALIGNMENT KITS! (A) $19.95 or (B) $29.95.

WANTED! RETAILERS! BONAFIDE DEALER INQUIRIES WELCOMED!

To Order: WRITE
OR CALL
(312) 851-6667 ANYTIME
C.O.D. & M/O's Welcomed
Personal Checks 14 Days to Clear

The Soft 64/128 Group
P.O. Box 111
Montgomery, IL. 60538

WE *WILL* BE UNDERSOLD

(But we will also give you what you pay for)

Aprotek has been helping Commodore owners build their systems for six years, and have discovered a couple of important facts. The most important thing is that many of you feel that after investing hard-earned money and especially after spending many hours of your **time** to make your computer do what you want it to do, you are very hesitant to change to a newer or different computer (that is also very incompatible with what you now have). After all, it still does what you bought it for. Typically, what you would rather do is improve what you have; find a faster or maybe an easier way to get the job done. That's where Aprotek comes in. We have dedicated our time and resources so you can achieve that goal. We have become known as the company that designs, manufactures and markets the most cost-effective add-on devices. Many times we are the only company that makes a certain item. We handle your order or inquiry in a quick and courteous manner. We support our dealers and customers in a way that keeps them coming back long after the "easy money" people are gone. Before looking at what we have to offer, remember our policy of satisfaction or your money back. Any product we sell has a two-week (after you get it) trial period so you can decide if you like it enough to keep it, plus a one-year (or more) parts and labor warranty. Plus support when you need it.

1200 BAUD COMMODORE MODEM

Everything from Electronic Mail (E-mail) to stock quotes and huge databases of every imaginable type is now on-line just waiting for you to dial up. All you need is a telephone line and a modem connected to your Commodore which allows you to download this information.

1200 baud is about four times as fast as 300 which means you spend less time and money getting the data you want and more time using it.

Recently we re-evaluated our modem line and discovered that the best price/performance tradeoff for our Commodore customers would be a straightforward, easy-to-use unit with no complex switch settings or indicators, but one that just did what our customers wanted without complications.

What do you get with your Aprotek 12C? Everything! You don't need to worry about cables, compatibility or anything else! We don't just sell hardware, we sell solutions. The Aprotek 12C plugs directly into your Commodore C-64, C-64C or C-128 User port. The 12C is a full-feature, 300 and 1200 baud modem with Auto Answer, Auto Dial, Touch-Tone or rotary dialing, has status indications on screen to let you know what is happening all the time. The 12C comes complete with "COMM TERM," a complete communications and terminal program on disk, and has a built-in speaker so you can hear it dial and connect. Just plug it into your computer and standard phone jack with the supplied cable. (No additional power supply required.) Also included is a free trial offer subscription to Compuserve, the complete user database.

Do you have more than one computer or do you plan to get another computer? Call or write for other models.

The bottom line:

Aprotek 12C (Commodore) order #12C ..... only **$ 89.95**
Aprotek 12AM (AMIGA) #12AM ..... only **$119.95**
Aprotek 12R (RS-232, Hayes compatible) #12R ... only **$119.95**

Shipping — Cont. US=$5, UPS Blue, Can, AK, HI, APO=$10.

Commodore Interfaces and Cables

Cardprint G-WIZ Printer Interface #1108	$46.95
Commodore 6 Pin Serial Cable (5 ft) #3006-5MM	$ 7.95
Commodore 6 Pin Serial Cable (8ft) #3006-8MM	$ 9.95
Commodore Serial Ext. (5 ft) #3006-5MF **$7.95,** (8 ft) #3006-8MF	$ 9.95
Amiga Printer Cable (6 ft) #3040-6MF, **$12.95**, (10 ft) #3040-10MF	$16.95
Centronics Parallel (6 ft) #3036-6MM, **$12.95**, (10 ft) #3036-10MM	$14.95

Shipping per above items: Cont. US =$3. Can, PR, HI, AK, APO, UPS Blue=$6

SEIKOSHA PRINTERS	**Price & Shipping**
SP-180AI Order #2050	$127.00 + $12.00
SP-1000VC (C-64) Order #2200	$137.00 + $12.00
SP-1000AS Serial Order #2500	$159.00 + $12.00
SP-1200AI (Epson/IBM) Order #2600	$161.00 + $12.00
SP-1200VC (Com) Order #2664	$153.00 + $12.00
MP-1300AI 300 CPS Order #2700	$298.00 + $14.00

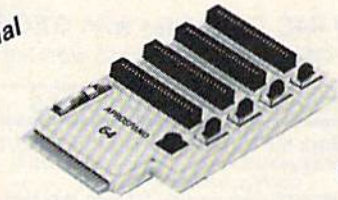
UNIVERSAL RS-232 INTERFACE

with Commodore User Port expansion. ONLY $39.95 + $3 S&H

Now you can connect and communicate with any of the popular RS-232 peripherals using your Commodore **User** Port. This superb expander opens a whole new world to your Commodore computer's capabilities. You can now connect to printers, modems and any other RS-232 device. If you already have something that connects to the User Port, don't worry because the port is duplicated on the outside edge of the interface. Simply plug it in and turn on the device you want to communicate with. Comes complete with sample driver program listings. Compatible with all Commodore home computers with a user port. 1-year warranty. **Order #5232.**

Aprospand-64™ Gives your Commodore 64 or 128 full expandability! This superbly designed expansion module plugs into the expansion port and gives you four switchable (singly or in any combination) expansion connectors—plus fuse protection—plus a reset button! Before you buy an expander, be sure that it has a fuse to protect your computer and that you can activate your cartridges in **any** combination allowed by the cartridges.

The Original



Fully C-128 Compatible

Order # 5064

NOW ONLY $29.95 + $3 S&H

"EXTENDER-64" — 10" Ribbon cable extender for your Commodore CARTRIDGE port. Used with Aprospand-64.
Order #5065 ..... **$19.95 + $3 S&H**

NEW! "USER EXTENDER" — 10" Ribbon cable extender for your Commodore USER port.
Order #5250 ..... **$21.95 + $3 S&H**

ORDER INFORMATION California residents add 6% tax. All prices are cash prices—VISA and MC add 3% to total. We ship the next business day on money orders, cashier's checks, and charge cards. A 14-day clearing period is required for checks. Prices and availability subject to change—CALL. **Available at Selected Dealers.** Dealer inquiries invited.

For information and in Calif. call **805/987-2454** (8-5 PST)
TO ORDER CALL TOLL FREE
1 (800) 962-5800 - USA (7-6 PST)
Or send order to:

APROTEK
Dept. CG
1071-A Avenida Acaso
Camarillo, CA 93010

STAND AND SHELF
ORGANIZE WORK AREA - GAIN SPACE
— INCREASE PRODUCTIVITY!

STAND - STURDY, HOLDS MONITOR/TV AT EYE LEVEL, PLENTY OF ROOM FOR OTHER WORK ITEMS.

SHELF - AT LAST, A PLACE FOR MANUALS, REFERENCE MATERIAL. TYPING IN-LINE WITH MONITOR. SELF STANDING; SLIDES OUT TO USE WASTED SPACE. SHELF, COMPUTER, CABLES, PAPERS STORE UNDER STAND TO FREE-UP WORK SPACE.

FINE FURNITURE, BEAUTIFUL WALNUT VENEER WOOD. SHELF IS GREAT FOR WIDE PRINTERS. FOR THE C-16/64/64C/128, VIC-20, PLUS/4. EASY ASSEMBLY. MADE IN U.S.A. 24 x 12 x 6.

TERMS: NO CREDIT CARDS OR C.O.D.'S PLEASE. ORDERS WITH CASHIERS CHECK OR MONEY ORDER ALLOW 3-4 WEEKS FOR DELIVERY. PERSONAL AND COMPANY CHECKS ALLOW ADDITIONAL 2 WEEKS CLEARANCE. U.S. FUNDS ONLY.

TO ORDER STAND WITH SHELF: SEND NAME, ADDRESS AND **$24.95** PLUS **$5.00** FOR SHIPPING AND HANDLING IN CONTINENTIAL USA. SHIPPING FOR CAN, PR, AK, HI IS **$15.00.** PA. RESIDENTS ADD 6% SALES TAX ON TOTAL, INCLUDING SHIPPING CHARGES.

J & K ENTERPRISES/G
P.O. BOX 2856 • WARMINSTER, PA 18974

LANDMARK v1.1

The Computer Reference Bible

NEW C64 UPDATE!

LANDMARK is now menu driven using either the keyboard or a joystick! New features such as printing Scripture and references (or notes) SIDE by SIDE on the same page! **C128 OWNERS**-The C128 version is now being developed, and will be included on the back of the C64 Program Disk. Use the C64 version until the C128 is done, then just load the new C128 version.

LANDMARK can assist your Bible Study three ways:

- SEARCHING the Bible for words and phrases
- MAKING YOUR OWN FILES by copying text from the Bible files and the search results adding your own comments to create Topical Files on any subject.
- CREATING YOUR OWN PERSONAL BIBLE(S) containing all your notes and comments, outlining of text; even reference your notes to individual verses. Unlimited size of your Personal Bible!

LANDMARK v1.1 consists of the entire King James Bible with the words of Christ in color, individual Verse References (as found in the margins of a good Bible book) and a Concordance of over 3300 words.

LANDMARK is 100% MACHINE LANGUAGE with many more features and a NEW LOW PRICE!

LANDMARK v1.1 for the Commodore 64/128 is $164.95

CALL or WRITE for our FREE BROCHURE!

P.A.V.Y. Software P.O. Box 1584
Ballwin, MO 63022 (314) 527-4505

Postage FREE! (in cont. US) MC & VISA add 3 1/2% ($5.98) MO residents add 5.725% sales tax. Personal checks clear in only 3 days!

DEALER INQUIRIES INVITED!

Commodore 64/128 are registered trademarks of Commodore Business Machines, Inc.

COMPUTE!'s Gazette is looking for utilities, games, applications, educational programs, and tutorial articles. If you've created a program that you think other readers might enjoy or find useful, send it, on tape or disk to:

Submissions Reviewer
COMPUTE! Publications
P.O. Box 5406
Greensboro, NC 27403

Please enclose an SASE if you wish to have the materials returned. Articles are reviewed within four weeks of submission.

BRAND NEW AMIGA 500 only $99

with trade-in of C128 Computer, 1571 Disk Drive, 1802 Monitor in good working condition.

BRAND NEW 64C Computer with GEOS only $79
with trade-in of C64 computer in good working condition.

We buy/sell/trade Commdore, IBM Compatible, Atari hardware-software-accessories

SUPER SEASON SPECIALS

NEW Commodore MPS 1200 Printer LIST $300. **Now $179.**
Commodore MPS Printer, high speed, draft/NLQ, graphics, tractor/friction feed.
NEW Commodore 1902 RGBI color monitor LIST $349. **Now $249.**
NEW Commodore 128D 128k CPU w/built-in drive. LIST $599. **Now $469.**
NEW Commodore 1581 3-1/2" disk drive. LIST $249. **Now $199.**
Limited time only, hurry!

We carry the full line of Commodore/Amiga/PC products.

NEW PRODUCTS

64C		C128		Amiga	
64C CPU w/GEOS	$159	128 CPU	$249	A500 CPU	$599
1351 Mouse	$35	128D w/built-in drive	$469	A2000 CPU	$call
1764 256k RAM	$129	1571 Drive	$219	A501 512k RAM	$425
1802C Color mon.	$189	1700 128k RAM	$99	A1010 3-1/2" drive	$219
1581 3-1/2"	$199	1750 512k RAM	$159	GENLOCK, SIDECAR...	
1541C Drive	$169	2002 RGB Mono	$299	Full Line!!!	

PC Compatibles
Commodore PC-10-2 Color System, C1902 RGB Color monitor, 640K RAM, (2) 360K drives, Printer & Modem port, MSDOS, GW BASIC. Only $869.

CRI PC+ System, 4.77/10 Mhz, more than 2x's as fast as the IBM XT, 640K RAM, (1) 360K drive. Printer/Modem/Game ports, Clock/calendar. Only $595.

20 Meg Hard drive $299. 30 Meg Hard drive $325.

MODEMS				PRINTERS	
Avatex 1200	$85	Star NX-10C	$199	Xetec JR Intfc	$39
Avatex 1200hc	$109	Star NX-10	$169	Xetec SR Intfc	$59
Avatex 2400hc	$209	Star NP-10	$149	Full line of STAR!	
Prac.Per.2400	$199				

We pay cash for used equipment and accessories. CALL for an instant price quote on your equipment. Nothing is too old or obsolete!

USED PRODUCTS

ALL PRODUCTS GUARANTEED!

Amiga 500 CPU	$479	1541 Drive	$119	Amber Monitor	$55
Amiga 2000 CPU	$1196	1571 Drive	$179	MPS-801 Print	$72
C64 CPU	$109	1670 Modem	$79	Gemini 10X	$125
C128 CPU	$199	1660 Modem	$34	Datacassette	$19
VIC20 CPU	$39	C1802 Mono	$149	Lots of software & books!	

Quantities of USED products vary, call before ordering.

We pay cash for damaged equipment!

$$$ YOUR EQUIPMENT $$$

Look at how much your equipment is worth in trade! (Prices shown are for good working products)

Amiga 500 CPU	$370	VIC20 CPU	$27	C1802 Monitor	$115
C64 CPU	$78	C1541 Drive	$83	Indus GT Drive	$100
C128 CPU	$134	C1571 Drive	$120	We pay $$$ for your books and software!	
SX-64 System	$210	C1702 Monitor	$90		

CALL to place order and for price quotes on your equipment.

Shipping and handling charges based on actual weight of order. Call for shipping and handling.

Computer Repeats, Inc.
2017 13th St., Suite A
Boulder, CO 80302
VOICE: **(303) 939-8144** MODEM: **(303) 939-8174**
MASTERCARD/VISA/CHOICE/C.O.D
Prices are subject to change without notice.

COMPUTER WORLD

AUTHORIZED DEALER FOR MOST MAJOR BRANDS

HOLIDAY SALE!!

4017 BROADWAY • E. OF STEINWAY ST. COR.
LONG ISLAND CITY, NEW YORK 11103
FOR INFORMATION CALL: 718- 726-8118
MONDAY-FRIDAY 10:30-7pm SUNDAY 11-6pm

DYNAMITE!

582 MIDDLE NECK ROAD
GREAT NECK, NEW YORK 11023
FOR INFORMATION CALL: 516- 829-2188
MONDAY-FRIDAY 11-7pm SUNDAY 11-6pm

PHONE AND MAIL ORDERS ONLY: CALL TOLL FREE 1-800-234-5888

ALL COMPUTERS & PERIPHERALS COMPLETE WITH AC ADAPTOR, OWNERS MANUAL & ALL CONNECTING CABLES.

ALL MERCHANDISE IS BRAND NEW & DIRECT FROM FACTORY. ALL COMPLETE WITH MFG. U.S.A. WARRANTY.

commodore COMPUTER PACKAGES

64C COMPLETE PACKAGE

- Commodore 64C
- Commodore 1541 Disk Drive
- Commodore Color Printer
- 12" Monitor
- 10 Disks

$349

128 COMPLETE PACKAGE

TO SUBSTITUTE 1571 FOR 1541 ADD $60.00

- Commodore 128
- Commodore 1541 Disk Drive
- Commodore Color Printer
- 12" Monitor
- 10 Disks

$449

128 DELUXE PACKAGE

- Commodore 128 Computer
- Commodore 1571 Disk Drive
- Commodore 1902 Color Monitor
- Commodore 80 Column Printer

$699

64C COLOR PACKAGE

- Commodore 64C Computer
- Commodore 1541C Disk Drive
- Commodore Color Printer
- Color Monitor

WITH GEOS PROGRAM!

$499

COMMODORE 128 PERSONAL COMPUTER

PERSONAL COMPUTER **$218**

COMMODORE 64C NEW!

CALL FOR PRICE!

- 64K RAM Powered Home Computer
- WITH GEOS PROGRAM

COMMODORE 128D NEW!

With Built-In 1571 Disk Drive!!

- CALL FOR LOW PRICE -

EXPANSION MODELS AVAILABLE! Call For Low Prices!!

VENDEX IBM PC/XT COMPATIBLE

- 512K
- 2- 360 Drives
- Parallel Serial Ports
- 12" Monitor

$1,000.00 WORTH OF SOFTWARE INCLUDED!!

Sale

$929

IBM - PC/XT COMPATIBLE PACKAGES

EPSON

EQUITY II PACKAGE IBM- PC/XT COMPATIBLE

$879

- Equity II Computer
- 640K Ram
- 360K Disk Drives
- 12" High Resolution
- Serial & Parallel Ports

BLUE CHIP

IBM- PC/XT COMPAIBLE PACKAGE

$525

- Blue Chip Keyboard
- 512K Expandable To 640K
- 6 Expansion Slots-Optional 20MB Hard Drive
- All Hook-Up Cables & Adaptors
- Package Of 10 Diskettes
- 12" Monitor

IBM® TURBO IBM PC/XT COMPATIBLE

$675

- 640K
- 2 Drive/360K
- 8088/2 CPU
- 4.77 8 MHZ
- 12" High Resolution Monitor
- Clock
- Calendar
- Date

COMMODORE PC10-2 IBM PC/XT COMPATIBLE

- 640K RAM
- Dual 360
- 12" Monitor

CALL!!

IBM® PC/XT/AT COMPATIBLE

- 640K RAM
- 1.2 MB

$1029

- 12" High Resolution Monitor
- 200 Watt Power Pack

SAME PACKAGE 20MB HARD DRIVE $1299.00

COMMODORE PERIPHERALS AND PRINTERS

New! 1541C Disk Drive	$155.00
1571 Disk Drive	$209.00
1581 Disk Drive	$ CALL
1802 Monitor	$175.00
1902 80 Column RGB Color Monitor	$219.00
1670 Modem	$115.00
1750 Expansion Module 512K	$165.00

•Expansion Modules Available•

1764 Expansion Module	$ CALL
MPS-803	$109.00
MPS-1000	$179.00
MPS-1200	$209.00

LARGE SELECTION OF PRINTERS IN STOCK!! — **MODEMS IN STOCK! •IBM •COMMODORE** — **FULL LINE OF COMMODORE SOFTWARE!!**

PANASONIC 1080i	$169.00
1090i	$179.00
STAR SG-10C	$169.00
NX-10	$165.00
NX-10C	$175.00
OKIDATA 120	$195.00
20 W/Plug n' Print	$188.00
EPSON LX-86 Printer	$199.00
FX-286E Printer	$449.00

SOFTWARE

XETEC Junior Interface	$34.95
XETEC Senior Interface	$54.95
F-15	$18.95
Pitstop	$12.95

AMIGA 1000

- 512K
- 1080 Monitor
- Disk Drive

CALL FOR LOW PRICE!

AMIGA 500

- 512K
- 3.5 Disk Drive
- Mouse
- 1080 Monitor

CALL FOR LOW PRICE!

AMIGA 2000

CALL FOR LOW PRICE!

- 1MB
- Expandable To 9MB
- Serial Centronics
- RGB
- Video Ports
- Built-In Mouse
- 1080 Monitor

Mastercard, Visa, American Express, Diner's Club, Carte Blanche, Discover Card. Certified And Bank Checks Welcome. C.O.D.'s Accepted Upon Approval. No Additional Surcharge For Credit Card Orders. Non-Certified Checks & Money Orders Must Wait For Clearance. N.Y. Residents Add Applicable Sales Tax. We Are Not Responsible For Typographical Errors. Prices And Availability Are Subject To Change Without Notice. To Return Defective Merchandise Call For Authorization Number. IBM PC/XT Are Registered Trademarks Of International Business Machine Corp. All Orders Can Be Shipped Air Express.

•SERVICE CENTER FOR COMMODORE•
•ATARI COMPUTERS AT LOW PRICES•

★★★★★★★★★

1541 DISK DRIVE ALIGNMENT PROGRAM

Finally, a complete disk drive alignment program!! No special equipment is required to properly align your disk drive. So easy to do, you can have your drive in alignment in about 1 hour.

Over 20,000 satisfied users!!

$44.95 + 3.50 shipping (U.S.)

★★★★★★★★★

PROGRAM PROTECTION MANUAL FOR THE C-64

Covers the disk drive, bad tracks and sectors, modified directories, cartridges and much more. Covers both basic and machine language protection schemes. A complete memory map and a disk with many helpful programs are included.

Perfect for beginners!

$29.95 + 3.50 shipping (U.S.)

★★★★★★★★★

PROGRAM PROTECTION MANUAL FOR THE C-64 VOLUME II

This manual begins where the first left off. It covers the most recent advances in program protection. It explains half-tracks, extra tracks and sectors, modified formats, nibble counting, track arcing, unimplemented opcodes and much, much more!!! It is written in that same 'easy to understand' style as the first volume. A disk is included to help you fully understand the principals.

Essential reading!

$34.95 + 3.50 shipping (U.S.)

★★★★★★★★★

CARTRIDGE BACKER

This package includes an expansion board, user's manual and program disk. Cartridge Backer will backup over 190 of the most popular cartridges to disk. Software included for file copying and disk to tape copying.

$54.95 + 3.50 shipping (U.S.)

C S M SOFTWARE, INC.

P.O. Box 563
Crown Point, IN 46307
(219) 663-4335

VISA AND MASTER CARDS ACCEPTED
DEALER INQUIRIES INVITED

LOTTO CIPHER

GET THE BEST ODDS ON ANY LOTTERY
SIX NUMBER - PICK FOUR - DAILY GAME

- PRODUCES FOUR COMBINATIONS OF NUMBERS TO CHOOSE FROM.
- ANY AMOUNT OF BALLS AND NUMBERS CAN BE PROGRAMMED.
- PRINTS OUT PAST LOTTO NUMBERS DRAWN, PAST COMPUTER PICKS, AND NUMBER DRAW FREQUENCY LIST.
- RANDOM NUMBER GENERATOR INCLUDED. $24.94

COMMODORE, COMMODORE AMIGA, AND IBM SYSTEMS

Window Magic

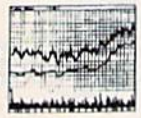
SUPER HI-RESOLUTION DRAWING IN MULTI OR MONO COLOR

- COPY
- FILL
- LINES
- DRAW
- COLOR SQUARES
- MIRROR, FLIP, AND SCROLLING WINDOWS
- ZOOM-EXPANDS A WINDOW TO DOUBLE SIZE
- SAVE AND LOAD YOUR WINDOWS ON DISK
- PRINTS ON STANDARD DOT MATRIX PRINTER
- CLONE COLOR ATTRIBUTES
- TYPES LETTERS AND GRAPHICS
- POLYGON SHAPES-EXPAND, SHRINK AND ROTATE, THEN STAMP ANYWHERE
- ZOOM PLOT-DRAW ON AN EXPANDED WINDOW AND YOUR DRAWING AT THE SAME TIME

$19.95 C-64/128

STOCK BROKER

PROFITS GUARANTEED OR YOUR MONEY BACK



BUYING GOOD QUALITY, VOLATILE ISSUES AND USING THIS TRADING SYSTEM WILL HAVE YOU FULLY INVESTED AT THE LOWEST PRICES AND CONVERTING TO CASH AS THE STOCK NEARS ITS PEAK.

- TECHNICAL TRADING THAT WORKS.
- BAR GRAPH PRINT-OUTS.
- RECORD UP TO 144 STOCKS ON A DISK.

$29.95

COMMODORE, COMMODORE AMIGA, AND IBM SYSTEMS

ACORN OF INDIANA, INC.

2721 OHIO STREET
MICHIGAN CITY, IN 46360

800-521-4536 219-879-2284

SHIPPING AND HANDLING, ADD $1.50 - C.O.D.'S ACCEPTED
VISA AND MASTER CARD ORDERS ADD 4%
INDIANA RESIDENTS ADD 5% SALES TAX

BUDGET MASTER™

The Home Budget System

***For the Commodore 64** (disk required)*

Designed especially for the home, BUDGET MASTER will help you get your budget off the ground and keep it flying. No knowledge of accounting is required to make full use of BUDGET MASTER's numerous time-saving features including:

- ✓ 100% Machine language
- ✓ Up to 80 categories
- ✓ 10 accounts + 10 credit cards
- ✓ Easy budget set up
- ✓ Fast, intuitive data entry
- ✓ Comprehensive analysis
- ✓ 2400-3600 Record transaction file
- ✓ Integrated business expenses
- ✓ Function keys for important data
- ✓ 90+ page manual

All this at a price that won't "break your budget"

MasterCard VISA

ONLY $24.95

+ $2.00 shipping and handling
Minnesota residents add 6% sales tax

To order send check, bank check, or money order to:

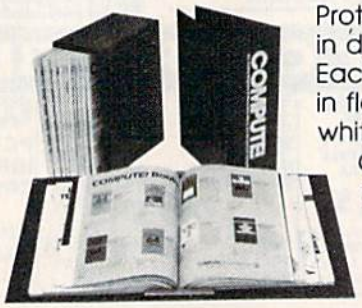
EYCHANER SOFTWARE CO.
P.O. Box 388
Grand Rapids, MN 55744-0388

Credit card orders: by mail specify card type (MasterCard or VISA), card number and expiration date. Or you can call 218-245-3273 for faster service (credit card orders only).

Normal ship time is 3-4 days after order is received.

Commodore 64 is a trademark of Commodore Business Machines Inc.
BUDGET MASTER is a trademark of Eychaner Software Co.

Save Your Copies of COMPUTE!



Protect your back issues of *COMPUTE!* in durable binders or library cases. Each binder or case is custom-made in flag-blue binding with embossed white lettering. Each holds a year of *COMPUTE!*. Order several and keep your issues of *COMPUTE!* neatly organized for quick reference. (These binders make great gifts, too!)

Cases:
$7.95 each;
3 for $21.95;
6 for $39.95

Binders
$9.95 each;
3 for $27.95;
6 for $52.95

(Please add $2.50 per unit for orders outside the U.S.)

Send in your prepaid order with the attached coupon

Mail to: Jesse Jones Industries, P.O. Box 5120,
Dept. Code COTE, Philadelphia, PA 19141

Please send me _____ COMPUTE! ☐ cases ☐ binders.
Enclosed is my check or money order for $ _____. (U.S. funds only.)

Name _____

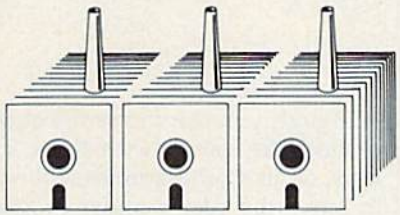
Address _____

City _____

State _____ Zip _____

Satisfaction guaranteed or money refunded.
Please allow 4–6 weeks for delivery.

Now you can operate your own HOLIDAY ORNAMENT FACTORY



Attention GEOS™ Owners...

Add a new dimension to your Christmas holiday. In fact, have **three**-dimensional fun by using your C-64 or C-128 to create your own colorful, innovative, full-size Christmas tree ornaments.

We supply:

- Instruction manual
- Diskette
- Colorful holiday paper and plans for 20 different ornaments.

Your printer marks the cut-and-fold lines on the reverse side of the beautiful holiday paper provided. Then ON-SCREEN ANIMATION will take you step by step through the construction of your work of art. Result: your own distinctive, unique holiday ornaments. It's fanciful fun. Order your Factory today.

(Bonus:Package will provide you with **Easter** decorations, as well!)

GEOS™ compatible, Icon driven, Mouse compatible. Works on C-64 or C-128 in 64 mode.

™ Tradename of Berkeley Softworks.

HOLIDAY ORNAMENT FACTORY

ONLY $24.95

Unleash the graphics potential of your C-128... with BASIC 8.

By Lou Wallace & David Darus

At last, your Commodore 128 can rival the 16-bit micros! Imagine your 128 (or 128-D) producing resolution of 640 x 200 in monochrome and 640 x 192 in 16 colors without any additional hardware. Sound impossible? Not with **Basic 8,** the new graphics language extension.

Basic 8 adds over 50 new graphics commands to standard C-128 Basic. Just select one of many graphics modes and draw 3-D lines, boxes, circles and a multitude of solid shapes with a single command. We've even added commands for windows, fonts, patterns and brushes.

To demonstrate the power and versatility of this new graphics language, we have created **Basic Paint,** a flexible icon-based drawing application. Written in **Basic 8, Basic Paint** supports an expanded Video RAM (64K), RAM Expanders, Joystick and the New 1351 Proportional Mouse.

Also included is an icon-based desk-top utility which provides quick and convenient access to each of your very own **Basic 8** creations.

All this graphics potential is yours at the special introductory price of $39.95. The package includes **Basic 8, Basic Paint,** the desk-top utility, a 180-page manual and a run time module. (80-Column RGB Monitor Required)

NEW with this package:

BASIC WRITE

BASIC PRINT

BASIC 8 Package

ONLY $39.95

Buy **BOTH** packages and SAVE... pay only **$59.95**

Mail your order to:
Patech Software, Inc., P.O. Box 6216, Vancouver, WA 98661
Phone orders welcome: 206-695-1393
Same day shipping. No C.O.D. orders outside USA.
CHECKS, MONEY ORDERS OR VISA / MASTERCARD / DISCOVER.
PLEASE NOTE: Free shipping & handling on all orders.
C.O.D. add $3.00 to total order. All orders must be paid in U.S. funds.

How To Type In *COMPUTE!'s Gazette* Programs

Each month, COMPUTE!'s Gazette publishes programs for the Commodore 128, 64, Plus/4, and 16. Each program is clearly marked by title and version. Be sure to type in the correct version for your machine. All 64 programs run on the 128 in 64 mode. Be sure to read the instructions in the corresponding article. This can save time and eliminate any questions which might arise after you begin typing.

We frequently publish two programs designed to make typing easier: The Automatic Proofreader, and MLX, designed for entering machine language programs.

When entering a BASIC program, be especially careful with DATA statements as they are extremely sensitive to errors. A mistyped number in a DATA statement can cause your machine to "lock up" (you'll have no control over the computer). If this happens, the only recourse is to turn your computer off then on, erasing what was in memory. So be sure to *save a program before you run it.* If your computer crashes, you can always reload the program and look for the error.

Special Characters

Most of the programs listed in each issue contain special control characters. To facilitate typing in any programs from the GAZETTE, use the following listing conventions.

The most common type of control characters in our listings appear as words within braces: {DOWN} means to press the cursor down key; {5 SPACES} means to press the space bar five times.

To indicate that a key should be *shifted* (hold down the SHIFT key while pressing another key), the character is underlined. For example, A means hold down the SHIFT key and press A. You may see strange characters on your screen, but that's to be expected. If you find a number followed by an underlined key enclosed in braces (for example, {8 A}), type the key as many times as indicated (in our example, enter eight SHIFTed A's).

If a key is enclosed in special brackets, [ ], hold down the Commodore key (at the lower left corner of the keyboard) and press the indicated character.

Rarely, you'll see a single letter of the alphabet enclosed in braces. This can be entered on the Commodore 64 by pressing the CTRL key while typing the letter in braces. For example, {A} means to press CTRL-A.

The Quote Mode

Although you can move the cursor around the screen with the CRSR keys, often a programmer will want to move the cursor under program control. This is seen in examples such as {LEFT}, and {HOME} in the program listings. The only way the computer can tell the difference between direct and programmed cursor control is *the quote mode.*

Once you press the quote key, you're in quote mode. This mode can be confusing if you mistype a character and cursor left to change it. You'll see a reverse video character (a graphics symbol for cursor left). In this case, you can use the DELete key to back up and edit the line. Type another quote and you're out of quote mode. If things really get confusing, you can exit quote mode simply by pressing RETURN. Then just cursor up to the mistyped line and fix it.

When You Read:	Press:	See:
{CLR}	SHIFT + CLR/HOME	
{HOME}	CLR/HOME	
{UP}	SHIFT + ↑ CRSR ↓	
{DOWN}	↑ CRSR ↓	
{LEFT}	SHIFT + ← CRSR →	
{RIGHT}	← CRSR →	
{RVS}	CTRL 9	
{OFF}	CTRL 0	
{BLK}	CTRL 1	
{WHT}	CTRL 2	
{RED}	CTRL 3	
{CYN}	CTRL 4	

When You Read:	Press:	See:
{PUR}	CTRL 5	
{GRN}	CTRL 6	
{BLU}	CTRL 7	
{YEL}	CTRL 8	
{ F1 }	f1	
{ F2 }	SHIFT + f1	
{ F3 }	f3	
{ F4 }	SHIFT + f3	
{ F5 }	f5	
{ F6 }	SHIFT + f5	
{ F7 }	f7	
{ F8 }	SHIFT + f7	

When You Read:	Press:	See:
←	←	
↑	SHIFT + ↑	

For Commodore 64 Only

[1]	COMMODORE 1	
[2]	COMMODORE 2	
[3]	COMMODORE 3	
[4]	COMMODORE 4	
[5]	COMMODORE 5	
[6]	COMMODORE 6	
[7]	COMMODORE 7	
[8]	COMMODORE 8	

Jump On The TENEX Express

No Gimmicks, No Hidden Charges, No Nonsense, Just Low Prices and Great Service!

FREE

DUST COVER & EVERYTHING BOOK

Discover the savings and easy shopping available from TENEX Computer Express PLUS receive a **FREE** dust cover for your C64, C128 or 64C! Cover is anti-static, 8-gauge vinyl sewn to our exacting standards with reinforced seams. Get to know our great products, extensive selection and fast service with a **FREE** copy of our *Everything Book for Commodore Computing.* ($2.95 Shipping Charge)

31627 C-64 Dust Cover and Catalog (G4H)
38464 C-128 Dust Cover and Catalog (G4H)
65180 64C Dust Cover and Catalog (G4H)

Hardware Specials

FDS-2 Disk Drive	$159.00	NEW! Star NX-1000	$CALL
Excel 2001 Disk Drive	$209.00	Star NX-10	$CALL
13-inch Color Monitor	$159.95	Star NP-10 Printer	$CALL
Pow'r Pak 64	$39.95	NEW! Commodore 128D Computer	$CALL
Pow'r Pak 128	$59.95	Commodore 1571 Disk Drive	$CALL
Okidata 180 Printer	$224.95	Commodore 1581 Disk Drive	$CALL
Okidata 120 Printer	$128.95	Commodore 2002 Monitor	$CALL
Seikosha SP-180VC	$149.95	Commodore 1351 Mouse	$33.95
Seikosha SP-1000VC	$189.95	1750 RAM Expansion- 512 K Cartridge, C128	$179.95
Super Graphix	$59.95		
Super Graphix Jr.	$44.95	1764 RAM Expansion- 256K Cartridge, C128	$124.95
Super Graphix Gold	$CALL		
IconTroller	$17.95	C128 Computer System	$CALL
Epyx 500XJ Joystick	$15.95		

Software Specials

GEOS-64	$39.95	GEOS-128	$49.95
Fontpack I	$19.95	geoFile	$36.95
geoCalc	$33.95	Writer's Workshop-64	$33.95
Deskpack	$24.95	Writer's Workshop-128	$44.95

Free! 52 "Page Everything" Book With Any Order!

From **microlat®** ...

THE 39¢ DISKETTE!

Are you paying too much for diskettes? Try our first quality, prime, 5 1/4" diskettes (no rejects, no seconds) at these fantastic sale prices and save, save, SAVE! Disks are packaged in boxes of 50; including diskettes in sleeves, labels, and write-protect tabs.

Each diskette is certified to be 100% error free and comes with a lifetime warranty (if you have a problem, we'll replace the diskette). All diskettes include hub reinforcement rings and write-protect notch.

All diskettes are double density and work in either single or double density drives.

SS, DD Diskettes, Box of 50
32391 $19.50 - 39¢ ea.!
DS, DD Diskettes, Box of 50
32403 $24.50 - 49¢ ea.!

Super Deal On Diskette Storage!

Only $9.95

- A whopping 100 disk (5 1/4") capacity.
- Lock and keys for extra security and easy carrying.
- Includes 8 index dividers with labels for organization of filing and retrieval.
- Made of durable anti-static, high impact plastic.
- Attractive smoked color lid.

Sug. Retail $19.95
66826 NOW ONLY $9.95

Unleash The Power of CP/M™ On Your C128!

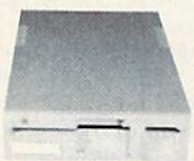
ONLY $22.95

Includes Free CP/M Programs
• Word Processor • Disk Utilities • Communications

CP/M Kit includes a helpful guide to using CP/M such as: stressing the unique features of Commodore's CP/M, using your 1541 or 1571 drive with CP/M, and using your modem to access electronic bulletin boards that offer free, downloadable software.

67392 2 Disks & Manual for C128 $22.95

$159 FSD-2 Disk Drive



Reviewed by *RUN Magazine:*
"...higher-than-average quality...10% faster than a 1541...half the size...you can rest assured that the FSD-2 will do a fine job for you."

Runs all C64 Commercial Software.
Full 1 Year Warranty.

66166 Disk Drive **$159**

THE BEST PRICES
THE BEST SERVICE
WHY SHOP ANYWHERE ELSE?

THE FAMOUS SLIK STIK™ Only $6.95!

The Slik Stik™ has been a favorite for years... and for good reason. It's just the right combination of responsiveness and accuracy. And the price can't be beat! From Suncom. 90 day warranty. Connects directly to Commodore Computers

42086 $6.95

From Your Friends At

TENEX Computer Express

We gladly accept mail orders!
P.O. Box 6578
South Bend, IN 46660

Ad G4H

Questions?
Call 219/259-7051

Shipping Charges

Order Amount	Charge
less than $20.00	$3.75
$20.00-$39.99	4.75
$40.00-$74.99	5.75
$75.00-$149.99	6.75
$150.00-$299.99	7.75
$300.00 & up	8.75

MasterCard · Discover Card · VISA

NO EXTRA FEE FOR CHARGES!

ORDER TOLL FREE

1-800-348-2778

INDIANA ORDER LINE 1-800-225-6838
WE VERIFY CHARGE CARD ADDRESSES

COMMODORE 64 is a registered trademark; and COMMODORE 128 is a trademark of Commodore Electronics, Ltd. APO, FPO, AK, HI, CN, VI, GU, and foreign orders are subject to additional shipping charges. NOTE: Due to publishing lead-times, product prices and specifications are subject to change without notice.

The Automatic Proofreader

Philip I. Nelson

"The Automatic Proofreader" helps you type in program listings for the 128, 64, Plus/4, and 16 and prevents nearly every kind of typing mistake.

Type in the Proofreader *exactly* as listed. Since the program can't check itself, type carefully to avoid mistakes. Don't omit any lines, even if they contain unfamiliar commands. After finishing, save a copy or two on disk or tape before running it. This is important because the Proofreader erases the BASIC portion of itself when you run it, leaving only the machine language portion in memory.

Next, type RUN and press RETURN. After announcing which computer it's running on, the Proofreader displays the message "Proofreader Active". Now you're ready to type in a BASIC program.

Every time you finish typing a line and press RETURN, the Proofreader displays a two-letter checksum in the upper-left corner of the screen. Compare this result with the two-letter checksum printed to the left of the line in the program listing. If the letters match, it's almost certain the line was typed correctly. If the letters don't match, check for your mistake and correct the line.

The Proofreader ignores spaces not enclosed in quotes, so you can omit or add spaces between keywords and still see a matching checksum. However, since spaces inside quotes are almost always significant, the Proofreader pays attention to them. For example, **10 PRINT"THIS IS BASIC"** will generate a different checksum than **10 PRINT"THIS ISBA SIC"**.

A common typing error is transposition—typing two successive characters in the wrong order, like PIRNT instead of PRINT or 64378 instead of 64738. The Proofreader is sensitive to the *position* of each character within the line and thus catches transposition errors.

The Proofreader does *not* accept keyword abbreviations (for example, ? instead of PRINT). If you prefer to use abbreviations, you can still check the line by LISTing it after typing it in, moving the cursor back to the line, and pressing RETURN. LISTing the line substitutes the full keyword for the abbreviation and allows the Proofreader to work properly. The same technique works for rechecking programs you've already typed in.

If you're using the Proofreader on the Commodore 128, Plus/4, or 16, *do not perform any GRAPHIC commands while the Proofreader is active.* When you perform a command like GRAPHIC 1, the computer moves everything at the start of BASIC program space—including the Proofreader—to another memory area, causing the Proofreader to crash. The same thing happens if you *run* any program with a GRAPHIC command while the Proofreader is in memory.

Though the Proofreader doesn't interfere with other BASIC operations, it's a good idea to disable it before running another program. However, the Proofreader is purposely difficult to dislodge: It's not affected by tape or disk operations, or by pressing RUN/STOP– RESTORE. The simplest way to disable it is to turn the computer off then on. A gentler method is to SYS to the computer's built-in reset routine (SYS 65341 for the 128, 64738 for the 64, and 65526 for the Plus/4 and 16). These reset routines erase any program in memory, so be sure to save the program you're typing in before entering the SYS command.

If you own a Commodore 64, you may already have wondered whether the Proofreader works with other programming utilities like "MetaBASIC." The answer is generally yes, *if you're using a 64 and activate the Proofreader after installing the other utility.* For example, first load and activate MetaBASIC, then load and run the Proofreader.

When using the Proofreader with another utility, you should disable *both* programs before running a BASIC program. While the Proofreader seems unaffected by most utilities, there's no way to promise that it will work with any and every combination of utilities you might want to use. The more utilities activated, the more fragile the system becomes.

The New Automatic Proofreader

```
10 VEC=PEEK(772)+256*PEEK(773)
   :LO=43:HI=44
20 PRINT "AUTOMATIC PROOFREADE
   R FOR ";:IF VEC=42364 THEN
   {SPACE}PRINT "C-64"
30 IF VEC=50556 THEN PRINT "VI
   C-20"
40 IF VEC=35158 THEN GRAPHIC C
   LR:PRINT "PLUS/4 & 16"
50 IF VEC=17165 THEN LO=45:HI=
   46:GRAPHIC CLR:PRINT"128"
60 SA=(PEEK(LO)+256*PEEK(HI))+
   6:ADR=SA
70 FOR J=0 TO 166:READ BYT:POK
   E ADR,BYT:ADR=ADR+1:CHK=CHK
   +BYT:NEXT
80 IF CHK<>20570 THEN PRINT "*
   ERROR* CHECK TYPING IN DATA
    STATEMENTS":END
90 FOR J=1 TO 5:READ RF,LF,HF:
   RS=SA+RF:HB=INT(RS/256):LB=
   RS-(256*HB)
100 CHK=CHK+RF+LF+HF:POKE SA+L
   F,LB:POKE SA+HF,HB:NEXT
110 IF CHK<>22054 THEN PRINT "
   *ERROR* RELOAD PROGRAM AND
   {SPACE}CHECK FINAL LINE":EN
   D
120 POKE SA+149,PEEK(772):POKE
    SA+150,PEEK(773)
130 IF VEC=17165 THEN POKE SA+
   14,22:POKE SA+18,23:POKESA+
   29,224:POKESA+139,224
140 PRINT CHR$(147);CHR$(17);"
   PROOFREADER ACTIVE":SYS SA
150 POKE HI,PEEK(HI)+1:POKE (P
   EEK(LO)+256*PEEK(HI))-1,0:N
   EW
160 DATA 120,169,73,141,4,3,16
   9,3,141,5,3
170 DATA 88,96,165,20,133,167,
   165,21,133,168,169
180 DATA 0,141,0,255,162,31,18
   1,199,157,227,3
190 DATA 202,16,248,169,19,32,
   210,255,169,18,32
200 DATA 210,255,160,0,132,180
   ,132,176,136,230,180
210 DATA 200,185,0,2,240,46,20
   1,34,208,8,72
220 DATA 165,176,73,255,133,17
   6,104,72,201,32,208
230 DATA 7,165,176,208,3,104,2
   08,226,104,166,180
240 DATA 24,165,167,121,0,2,13
   3,167,165,168,105
250 DATA 0,133,168,202,208,239
   ,240,202,165,167,69
260 DATA 168,72,41,15,168,185,
   211,3,32,210,255
270 DATA 104,74,74,74,74,168,1
   85,211,3,32,210
280 DATA 255,162,31,189,227,3,
   149,199,202,16,248
290 DATA 169,146,32,210,255,76
   ,86,137,65,66,67
300 DATA 68,69,70,71,72,74,75,
   77,80,81,82,83,88
310 DATA 13,2,7,167,31,32,151,
   116,117,151,128,129,167,136
   ,137
```

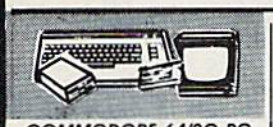
COMPUTER DISCOUNTS ON ALL YOUR COMPUTER NEEDS

MIBRO COMPANY

COMPUTER DISCOUNTS ON ALL YOUR COMPUTER NEEDS

64 WEST 36th ST. N.Y.C., N.Y. 10018

OUR ONLY STORE!! ESTABLISHED SINCE 1950



COMMODORE 64/2O PC. DELUXE PACKAGE OUTFIT

OUTFIT INCLUDES: COMMODORE 64 KEYBOARD •1541 DISC DRIVE •12" COMPUTER MONITOR & PRINTER FOR COMMODORE •AC ADAPTER •OWNERS MANUAL •DISC DRIVE HEAD CLEANER •PACKAGE OF 10 DISKETTES

$348 COMPLETE

COMMODORE 64/2O PC. DREAM OUTFIT

OUTFIT INCLUDES: COMMODORE 64 KEYBOARD •1541 DISC DRIVE •13" COLOR MONITOR •COMMODORE PRINTER •AC ADAPTER •OWNERS MANUAL •DISC DRIVE HEAD CLEANER •PACKAGE OF 10 DISKETTES

$438 COMPLETE

COMMODORE 128/2O PC. DELUXE PACKAGE OUTFIT

OUTFIT INCLUDES: COMMODORE 128 KEYBOARD •1541 DISC DRIVE •12" COMPUTER MONITOR •COMMODORE PRINTER •AC ADAPTER •OWNERS MANUAL •DISC DRIVE HEAD CLEANER •PACKAGE OF 10 DISKETTES

$448 COMPLETE

COMMODORE 128/2O PC. DREAM OUTFIT

OUTFIT INCLUDES: COMMODORE 128 KEYBOARD •1571 DISC DRIVE •13" COLOR MONITOR •COMMODORE PRINTER •AC ADAPTER •OWNERS MANUAL •DISC DRIVE HEAD CLEANER •PACKAGE OF 10 DISKETTES

$578 COMPLETE

COMMODORE 128/2O PC. PROFESSIONAL OUTFIT

OUTFIT INCLUDES: COMMODORE 128 KEYBOARD •1571 DISC DRIVE •13" RGB COLOR MONITOR •COMMODORE MPS-1000 PRINTER •AC ADAPTER •OWNERS MANUAL DISC DRIVE HEAD CLEANER •PACKAGE OF 10 DISKETTES

$688 COMPLETE

NEW PRODUCTS FROM commodore

COMMODORE128D/ Features Include: 128K Ram Memory •Built-in 5¼" Double Sided Floppy Drive •Detachable 128 Keyboard

COMMODORE 1581/ 3.5" 360K Double Density Disc Drive For Use With Commodore Computers

COMMODORE CM-2002/ High Resolution •RGB Color Monitor For Commodore Computers **CALL FOR SPECIAL LOW PRICES!!**

commodore

COMMODORE 64-C

FEATURES INCLUDE: 64K RAM MEMORY •2OK ROM •BUILT-IN BASIC •BUILT-IN GEOS

CALL FOR NEW LOW PRICE!!

AMIGA

COMMODORE AMIGA 5OO COMPLETE ALL IN ONE COMPUTER OUTFIT

FEATURES INCLUDE: 512K RAM EXPANDABLE TO 1.2 MEGABYTES •REAL TIME CLOCK •BUILT-IN 88OK DOUBLE SIDED 3.5" DRIVE

CALL FOR NEW LOW PRICE!

commodore

HARDWARE & SOFTWARE

COMMODORE 1571 Drive	COMMODORE 1802-C Monitor
COMMODORE 1541C Drive	COMMODORE 1902-A Monitor
COMMODORE MPS-1000 Printer	COMMODORE 1670 Modem
COMMODORE MPS-1200 Printer	COMMODORE 1700 Expander
COMMODORE MPS-803 Printer	COMMODORE 1750 Expander
COMMODORE 128 Computer	COMMODORE 1764 Expander
COMMODORE 64 Computer	COMMODORE 1351 Mouse

ALL IN STOCK!! GREATLY DISCOUNTED!!

AMIGA

COMMODORE AMIGA 2000

Features Include: 1 MB Memory Expandable To 9 MB •Built-in Serial Centronics •RGB •Video Ports •Built-in Mouse

CALL FOR NEW LOW PRICE!!

ALSO AVAILABLE: AMIGA 2002 •MONITOR •3.5" INTERNAL DRIVE •BRIDGE CORD •HARD DRIVE CONTROLLER •2 MB RAM EXPANDER

AMIGA

COMMODORE AMIGA 1000 COMPLETE ALL IN ONE PACKAGE

PACKAGE INCLUDES: 512K RAM MEMORY •BUILT IN 3.5" 720K MICRODRIVE •ADVANCED GRAPHICS & SOUND CHIP •12" COMPUTER MONITOR

$699 COMPLETE

APPLE II-C COMPLETE ALL IN ONE COMPUTER PACKAGE

PACKAGE INCLUDES: APPLE II-C •APPLE DISC DRIVE •12" COMPUTER MONITOR OWNERS MANUAL •DISC DRIVE HEAD CLEANER •AC ADAPTER •PACKAGE OF 10 DISKETTES

$599 COMPLETE

APPLE II-E COMPLETE ALL IN ONE COMPUTER PACKAGE

PACKAGE INCLUDES: APPLE II-E •DISC DRIVE • 12" COMPUTER MONITOR • OWNERS MANUAL •DISC DRIVE HEAD CLEANER •AC ADAPTER •PACKAGE OF 10 DISKETTES

CALL FOR NEW LOW PRICE!!

Franklin ACE 500

APPLE COMPATIBLE

Features Include: 256K Ram Memory •12 Programmable Function Keys •Numeric Keypad •Built In Parallel Serial Ports •RGB External •Drive Ports

CALL FOR NEW LOW PRICE!!

20 MEGABYTE HARD DRIVES AVAILABLE FOR IBM COMPATIBLE COMPUTERS ADD $250

IBM/XT COMPATIBLE© TURBO 2O PIECE OUTFIT

Includes: IBM/XT Compatible Keyboard •Disc Drive •10 Diskettes •Disc Drive Head Cleaner •Owners Manual •AC Adapter •Free Software •12" Computer Monitor •360K Floppy Disc Drive •Game Cartridge

$988

COMMODORE PC1O-1 2O PC. OUTFIT IBM/XT COMPATABLE©

Features Include: 512K Ram Expandable To 640K •6 Expansion Slots •Parallel & Serial Ports • Opt. 20MB Hard Drive

Package Includes: PC10-1 Keyboard W/ 360K Floppy Drive •12" Computer Monitor •Package Of 10 Diskettes •Disc Drive Head Cleaner •Game Cartridge

$498

COMMODORE PC1O-2 2O PC. OUTFIT IBM/XT COMPATIBLE©

$598

Features Include: 640K Ram •6 Expansion Slots •Parallel & Serial Ports •Opts. 20MB Hard Drive

Package Includes: PC10-2 Keyboard W/ Dual Floppy Drive •12" Computer Monitor •Pkge. 10 Diskettes •Disc Drive Head Cleaner

BLUE CHIP

2O PIECE OUTFIT IBM/XT COMPATABLE

Features Include: 512K Ram Expandable To 640K Ram •6 Expansion Slots Parallel & Serial Ports •Opt. 20MB Hard Drive

Package Includes: Blue Chip Keyboard W/ 360K Floppy Drive •12" Computer Monitor •Package Of 10 Diskettes •Disc Drive Head Cleaner •Game Cartridge

$448

EPSON EQUITY 1

2O PIECE OUTFIT IBM/XT COMPATABLE©

$598

Features Includes: 256K Ram Expandable To 640K •Parallel & Serial Ports •Opt. 20MB Hard Drive

Package Includes: Equity 1 Keyboard W/ 360K Floppy Drive •12" Computer Monitor •Package Of 10 Diskettes •Disc Drive Head Cleaner •Game Cartridge

EPSON EQUITY 1 PLUS IN STOCK!!

EPSON EQUITY II

2O PIECE OUTFIT IBM/XT COMPATIBLE©

$749

Features Include: 640K Ram •4.77/7.13 Switchable Megahertz •Parallel & Serial Ports

Package Includes: Equity II Keyboard W/ 640K Floppy Drive •12" Computer Monitor •Pkge. 10 Diskettes •Disc Drive Head Cleaner •Game Cartridge

star micronics

PRINTERS

Up To 300 cps Tractor & Friction Feed 45 cps Letter Quality

STAR NP-10 •STAR ND-10 •STAR NL-10 •STAR NB24-15 •STAR NX-10 •STAR NB-15 •STAR NX-10C •STAR NR-15 •STAR NX-15 •STAR ND-15 •All Models Available

PRICES GREATLY DISCOUNTED!!

OKIMATE 2O COLOR PRINTER

Features Include: 80 cps •Full Color 40 cps Letter Quality

AVAILABLE FOR: IBM•ATARI•APPLE COMMODORE•AMIGA

GREATLY DISCOUNTED!!

MAGNAVOX PROFESSIONAL COMPUTER MONITORS

Built-in Tilt Stand •2 Year USA Guarantee •Non-glare Treated Face Plate

7BM613 monochrome	8CM515 CGA color
7BM623 monochrome	8CM540 EGA color
8CM643 CGA color	8CM783 multi-scan

ALL MONITORS IN STOCK/DISCOUNTED!!

EPSON PRINTERS

•180 cps Bi-directional •60 cps Letter Quality •24 Pin Printed •Built-in 7K/1K Buffer

LX-86 •EX-1000 •FX-86E •LO-1000 •EX-800 •LO-2500 •LO-800 •GO-3500 •FX-286E

All Models Available

PRICES GREATLY DISCOUNTED!!

ORDER NOW!! PHONE ORDERS ONLY CALL TOLL FREE

1 (800) 223-0322

FOR INFORMATION CALL (212) 695-7133

NEW YORK STATE RESIDENTS CALL (212) 695-7133/695-7134

ON ALL PHONE ORDERS PLEASE CALL
MON. Thru SAT. 9:30AM-7:30PM
SUNDAY 10:00AM-6:00PM

Use Your Master Charge, Visa, American Express or Send Money Order, Certified Check

WE NOW TAKE DISCOVER AND DINERS CLUB

MIBRO CO., INC.
64 West 36th Street, New York, N.Y. 10018
(Between 5th & 6th Avenues)
MON. THRU SAT. 9:30AM-7:30PM SUN. 10AM-6PM

All merchandise brand new factory fresh. Minimum shipping and handling charge $4.95 Shipping charges non-refundable. For mail orders please call before sending in money order. No money orders will be excepted without order#. All prices subject to change without notice. Quantities may be limited on some items. Refunds within seven days with original packaging and unfilled guarantee card. All orders subject to acceptance and verification. Prices subject to manufacturers increase and or decrease. Not responsible for typographical errors. For information please call customer service, please call between 12:30 pm - 6:30 pm. Prices good for mail order only. Pictures are for illustration and may not be exact. Department of Consumer Affairs License #800-253

MLX Machine Language Entry Program For Commodore 64

Ottis Cowper, Technical Editor

"MLX" is a labor-saving utility that allows almost fail-safe entry of Commodore 64 machine language programs.

Type in and save some copies of MLX—you'll want to use it to enter future ML programs from COMPUTE!'s GAZETTE. When you're ready to enter an ML program, load and run MLX. It asks you for a starting address and an ending address. These addresses appear in the article accompanying the MLX-format program listing you're typing.

If you're unfamiliar with machine language, the addresses (and all other values you enter in MLX) may appear strange. Instead of the usual decimal numbers you're accustomed to, these numbers are in *hexadecimal*—a base 16 numbering system commonly used by ML programmers. Hexadecimal—hex for short—includes the numerals 0–9 and the letters A–F. But don't worry—even if you know nothing about ML or hex, you should have no trouble using MLX.

After you enter the starting and ending addresses, you'll be offered the option of clearing the workspace. Choose this option if you're starting to enter a new listing. If you're continuing a listing that's partially typed from a previous session, don't choose this option.

A functions menu will appear. The first option in the menu is ENTER DATA. If you're just starting to type in a program, pick this. Press the E key, and type the first number in the first line of the program listing. If you've already typed in part of a program, type the line number where you left off typing at the end of the previous session (be sure to load the partially completed program before you resume entry). In any case, make sure the address you enter corresponds to the address of a line in the listing you are entering. Otherwise, you'll be unable to enter the data correctly. If you pressed E by mistake, you can return to the command menu by pressing RETURN alone when asked for the address. (You can get back to the menu from most options by pressing RETURN with no other input.)

Entering A Listing

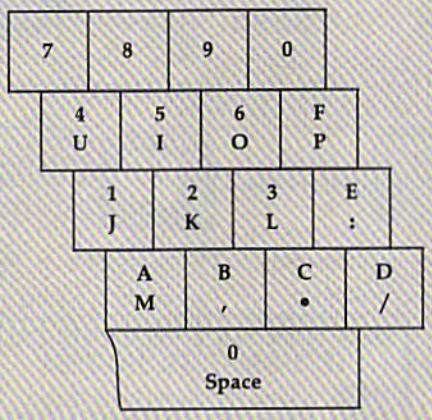
Once you're in Enter mode, MLX prints the address for each program line for you. You then type in all nine numbers on that line, beginning with the first two-digit number after the colon (:). Each line represents eight data bytes and a checksum. Although an MLX-format listing appears similar to the "hex dump" listings from a machine language monitor program, the extra checksum number on the end allows MLX to check your typing.

When you enter a line, MLX recalculates the checksum from the eight bytes and the address and compares this value to the number from the ninth column. If the values match, you'll hear a bell tone, the data will be added to the workspace area, and the prompt for the next line of data will appear. But if MLX detects a typing error, you'll hear a low buzz and see an error message. The line will then be redisplayed for editing.

Invalid Characters Banned

Only a few keys are active while you're entering data, so you may have to unlearn some habits. You *do not* type spaces between the columns; MLX automatically inserts these for you. You *do not* press RETURN after typing the last number in a line; MLX automatically enters and checks the line after you type the last digit.

Only the numerals 0–9 and the letters A–F can be typed in. If you press any other key (with some exceptions noted below), you'll hear a warning buzz. To simplify typing, the numeric keypad modification from the March 1986 "Bug-Swatter" column is now incorporated in the listing. The keypad is active only while entering data. Addresses must be entered with the normal letter and number keys. The figure below shows the keypad configuration:



MLX checks for transposed characters. If you're supposed to type in A0 and instead enter 0A, MLX will catch your mistake. There is one error that can slip past MLX: Because of the checksum formula used, MLX won't notice if you accidentally type FF in place of 00, and vice versa. And there's a very slim chance that you could garble a line and still end up with a combination of characters that adds up to the proper checksum. However, these mistakes should not occur if you take reasonable care while entering data.

Editing Features

To correct typing mistakes before finishing a line, use the INST/DEL key to delete the character to the left of the cursor. (The cursor-left key also deletes.) If you mess up a line really badly, press CLR/HOME to start the line over. The RETURN key is also active, but only before any data is typed on a line. Pressing RETURN at this point returns you to the command menu. After you type a character of data, MLX disables RETURN until the cursor returns to the start of a line. Remember, you can press CLR/HOME to quickly get to a line number prompt.

More editing features are available when correcting lines in which MLX has detected an error. To make corrections in a line that MLX has redisplayed for editing, compare the line on the screen with the one printed in the listing, then move the cursor to the mistake and type the correct key. The cursor left and right keys provide the normal cursor controls. (The INST/DEL key now works as an alternative cursor-left key.) You cannot move left beyond the first character in the line. If you try to move beyond the rightmost character, you'll reenter the line. During editing, RETURN is active; pressing it tells MLX to recheck the line. You can press the CLR/HOME key to clear the entire line if you want to start from scratch, or if you want to get to a line number prompt to use RETURN to get back to the menu.

Display Data

The second menu choice, DISPLAY DATA, examines memory and shows the contents in the same format as the program listing (including the checksum). When you press D, MLX asks you for a starting address. Be sure that the starting address you give corresponds to a line number in the listing. Otherwise, the checksum display will be meaningless. MLX displays program lines until it reaches the end of the program, at which point the menu is redis-

CHIP LEVEL DESIGNS PRESENTS

- RapiDOS -

THE SUPER-FAST PARALLEL DISK OPERATING SYSTEM FOR THE COMMODORE 64 AND 1541 DISK DRIVE!

- **All** disk access is handled at super-fast parallel speed! (LOAD, SAVE, directory, SEQ & REL files, scratch, validate, format).
- Designed to support multiple drive systems.
- Parallel Centronics printer support with file spooling capability.
- Many useful, timesaving features (DOS Wedge, screen dump, resident monitor).
- No loss of compatibility.
- Far too many features to list in this ad . . . and perhaps in this magazine! (Call or write to get all the details!)

. . . and if you want the ultimate, get RapiDOS Professional!

- Gives even faster disk access!
- Uses 8k RAM track buffering and hardware GCR conversion!
- Provides 40 track extension (749 blocks free!)
- Adds 20 new disk commands (i.e., lock files, change disk name).

Here's what people are saying about RapiDOS:

Mike J. Henry (Basement Boys Software) - *"It's amazing how incredibly fast it is, I'm impressed!"*
Mitch S. (Eaglesoft Inc.) - *"Very fast, very reliable, and very compatible. I love it!"*
J.F. Jones (ADP) - *"Superbases' speed is increased greatly, and it's now a dream to use!"*

Function	Normal DOS	RapiDOS	RapiDOS Pro	Your System
Load 202 blocks	128 sec.	15 sec.	3 sec.	
Save 202 blocks	196 sec.	98 sec.	8 sec.	
Format 35 tracks	90 sec.	24 sec.	18 sec.	

Compare these speeds with your current system and see why RapiDOS puts the C-64 into a different league!

RapiDOS requires a socketed kernal ROM U4, and is available in versions for the 64c, 128 in 64 mode, and 1541c (please specify when ordering). RapiDOS is easily upgradeable to the Professional Version. RapiDOS Professional drive controller is **(c) '87 mts data GbR,** the creators of the best European parallel systems.

At these affordable prices no C-64 owner should be without RapiDOS!

RapiDOS $49.95 **RapiDOS Professional $99.95**

MASS DUPLICATOR 1541

- For the C64/128 with a single 1541 disk drive.
- 15 second, 4 pass backup for standard disks!
- 25 second full GCR Super Nibbler, the most powerful yet!
- 9 second disk format!
- Fast loader!
- Quick installation. **$32.95**
- Can be upgraded to RapiDOS

MASS DUPLICATOR MSD

- A must for any MSD SD-2 owner.
- 15 second standard disk backup!
- 18 second full GCR Quick Nibbler!
- 9 second disk format! **$25.95**

MSD AUTO COPY ROM

- Adds new Fast Backup commands!
- Turns the MSD SD-2 into a dedicated copying drive (no computer needed). **$29.95**

C-64 BURST-ROM

- Gives the 64 'Burst Mode' when used with a 1571 or 1581 disk drive!
- Loads 100 blocks in 6 seconds on a 1571, 4 seconds on a 1581!
- Fast directory, SEQ, and REL file access!
- Built in DOS wedge!
- Simple installation. (Kernal ROM U4 must be socketed) **$32.95**

C-128 BURST-ROM

- Lets the 128 run at 'Burst' speed when in 64 mode!
- Provides the same features as the C-64 Burst-ROM! **$38.95**

STILL TO COME

- MSD SD-1 Fast Copier!
- 1571 Mass Duplicator!
- 1581 Utility Pack!

TURBO 64

- Speed-up cartridge for the C-64, just plug it in!
- Adjust the clock rate from 100 khz (1/10 normal) to 4 mhz (4x normal)!
- Uses 8/16 bit 65816 microprocessor (same as the Apple][gs... but twice as fast)!
- Spread sheets, BASIC, flight sims, graphics, and now GEOS... all are accelerated! **$189.95**

CHIP LEVEL DESIGNS

Cash, Check, Money Order, M.C. or Visa

$3.00 shipping on all orders
C.O.D.'s add $3.00

P.O. BOX 603
ASTORIA, OR 97103-0603

(503) 861-1622

Dealer, Distributor, & Group Pricing Available

played. You can pause the display by pressing the space bar. (MLX finishes printing the current line before halting.) Press space again to restart the display. To break out of the display and get back to the menu before the ending address is reached, press RETURN.

Other Menu Options

Two more menu selections let you save programs and load them back into the computer. These are SAVE FILE and LOAD FILE; their operation is quite straightforward. When you press S or L, MLX asks you for the filename. You'll then be asked to press either D or T tc select disk or tape.

You'll notice the disk drive starting and stopping several times during a load or save. Don't panic; this is normal behavior. MLX opens and reads from or writes to the file instead of using the usual LOAD and SAVE commands. Disk users should also note that the drive prefix 0: is automatically added to the filename (line 750), so this should *not* be included when entering the name. This also precludes the use of @ for Save-with-Replace, so remember to give each version you save a different name.

Remember that MLX saves the entire workspace area from the starting address to the ending address, so the save or load may take longer than you might expect if you've entered only a small amount of data from a long listing. When saving a partially completed listing, make sure to note the address where you stopped typing so you'll know where to resume entry when you reload.

MLX reports the standard disk or tape error messages if any problems are detected during the save or load. (Tape users should bear in mind that Commodore computers are never able to detect errors during a save to tape.) MLX also has three special load error messages: INCORRECT STARTING ADDRESS, which means the file you're trying to load does not have the starting address you specified when you ran MLX; LOAD ENDED AT *address*, which means the file you're trying to load ends before the ending address you specified when you started MLX; and TRUNCATED AT ENDING ADDRESS, which means the file you're trying to load extends beyond the ending address you specified when you started MLX. If you see one of these messages and feel certain that you've loaded the right file, exit and rerun MLX, being careful to enter the correct starting and ending addresses.

The QUIT menu option has the obvious effect—it stops MLX and enters BASIC. The RUN/STOP key is disabled, so the Q option lets you exit the program without turning off the computer. (Of course, RUN/STOP-RESTORE also gets you out.) You'll be asked for verification; press Y to exit to BASIC, or any other key to return to the menu. After quitting, you can type RUN again and reenter MLX without losing your data, as long as you don't use the clear workspace option.

The Finished Product

When you've finished typing all the data for an ML program and saved your work, you're ready to see the results. The instructions for loading and using the finished product vary from program to program. Some ML programs are designed to be loaded and run like BASIC programs, so all you need to type is LOAD *"filename"*,8 for disk or LOAD *"filename"* for tape, and then RUN. Such programs will usually have a starting address of 0801 for the 64. Other programs must be reloaded to specific addresses with a command such as LOAD *"filename"*,8,1 for disk or LOAD *"filename"*,1,1 for tape, then started with a SYS to a particular memory address. On the Commodore 64, the most common starting address for such programs is 49152, which corresponds to MLX address C000. In either case, you should always refer to the article which accompanies the ML listing for information on loading and running the program.

An Ounce Of Prevention

By the time you finish typing in the data for a long ML program, you may have several hours invested in the project. Don't take chances—use our "Automatic Proofreader" to type the new MLX, and then test your copy *thoroughly* before first using it to enter any significant amount of data. Make sure all the menu options work as they should. Enter fragments of the program starting at several different addresses, then use the Display option to verify that the data has been entered correctly. And be sure to test the Save and Load options several times to insure that you can recall your work from disk or tape. Don't let a simple typing error in the new MLX cost you several nights of hard work.

MLX For Commodore 64

```
SS 10 REM VERSION 1.1: LINES 8
      30,950 MODIFIED, LINES 4
      85-487 ADDED
EK 100 POKE 56,50:CLR:DIM IN$,
      I,J,A,B,A$,B$,A(7),N$
DM 110 C4=48:C6=16:C7=7:Z2=2:Z
      4=254:Z5=255:Z6=256:Z7=
      127
CJ 120 FA=PEEK(45)+Z6*PEEK(46)
      :BS=PEEK(55)+Z6*PEEK(56
      ):H$="0123456789ABCDEF"
SB 130 R$=CHR$(13):L$="{LEFT}"
      :S$=" ":D$=CHR$(20):Z$=
      CHR$(0):T$="{13 RIGHT}"
CQ 140 SD=54272:FOR I=SD TO SD
      +23:POKE I,0:NEXT:POKE
      {SPACE}SD+24,15:POKE 78
      8,52
FC 150 PRINT"{CLR}"CHR$(142)CH
      R$(8):POKE 53280,15:POK
      E 53281,15
EJ 160 PRINT T$" {RED}{RVS}
      {2 SPACES}{8 @}
      {2 SPACES}"SPC(28)"
      {2 SPACES}{OFF}{BLU} ML
      X II {RED}{RVS}
      {2 SPACES}"SPC(28)"
      {12 SPACES}{BLU}"
FR 170 PRINT"{3 DOWN}
      {3 SPACES}COMPUTE!'S MA
      CHINE LANGUAGE EDITOR
      {3 DOWN}"
JB 180 PRINT"{BLK}STARTING ADD
      RESS{4}";:GOSUB300:SA=A
      D:GOSUB1040:IF F THEN18
      0
GF 190 PRINT"{BLK}{2 SPACES}EN
      DING ADDRESS{4}";:GOSUB
      300:EA=AD:GOSUB1030:IF
      {SPACE}F THEN190
KR 200 INPUT"{3 DOWN}{BLK}CLEA
      R WORKSPACE [Y/N]{4}";A
      $:IF LEFT$(A$,1)<>"Y"TH
      EN220
PG 210 PRINT"{2 DOWN}{BLU}WORK
      ING...";:FORI=BS TO BS+
      EA-SA+7:POKE I,0:NEXT:P
      RINT"DONE"
DR 220 PRINTTAB(10)"{2 DOWN}
      {BLK}{RVS} MLX COMMAND
      {SPACE}MENU {DOWN}{4}":
      PRINT T$"{RVS}E{OFF}NTE
      R DATA"
BD 230 PRINT T$"{RVS}D{OFF}ISP
      LAY DATA":PRINT T$"
      {RVS}L{OFF}OAD FILE"
JS 240 PRINT T$"{RVS}S{OFF}AVE
       FILE":PRINT T$"{RVS}Q
      {OFF}UIT{2 DOWN}{BLK}"
JH 250 GET A$:IF A$=N$ THEN250
HK 260 A=0:FOR I=1 TO 5:IF A$=
      MID$("EDLSQ",I,1)THEN A
      =I:I=5
FD 270 NEXT:ON A GOTO420,610,6
      90,700,280:GOSUB1060:GO
      TO250
EJ 280 PRINT"{RVS} QUIT ":INPU
      T"{DOWN}{4}ARE YOU SURE
       [Y/N]";A$:IF LEFT$(A$,
      1)<>"Y"THEN220
EM 290 POKE SD+24,0:END
JX 300 IN$=N$:AD=0:INPUTIN$:IF
      LEN(IN$)<>4THENRETURN
KF 310 B$=IN$:GOSUB320:AD=A:B$
      =MID$(IN$,3):GOSUB320:A
      D=AD*256+A:RETURN
PP 320 A=0:FOR J=1 TO 2:A$=MID
      $(B$,J,1):B=ASC(A$)-C4+
      (A$>"@")*C7:A=A*C6+B
JA 330 IF B<0 OR B>15 THEN AD=
      0:A=-1:J=2
GX 340 NEXT:RETURN
CH 350 B=INT(A/C6):PRINT MID$(
      H$,B+1,1);:B=A-B*C6:PRI
      NT MID$(H$,B+1,1);:RETU
      RN
RR 360 A=INT(AD/Z6):GOSUB350:A
      =AD-A*Z6:GOSUB350:PRINT
      ":";
BE 370 CK=INT(AD/Z6):CK=AD-Z4*
      CK+Z5*(CK>Z7):GOTO390
PX 380 CK=CK*Z2+Z5*(CK>Z7)+A
```

Our products have been called addictive, fascinating, educational, realistic, intelligent -- but mostly they're just fun. Choose from the following programs that simulate real-life jobs in a way that challenges the users' problem-solving skills.

TRAIN DISPATCHER - An introduction to Centralized Traffic Control (CTC) on railroads. Gain skill in routing rail traffic as you become the dispatcher in this simulation. Commodore 64, 128 - $15; Atari 800, 800XL, 130XE - $15; Apple II Family - $20; IBM PC (Color graphic required) and compatibles - $25.

SUPER DISPATCHER - An advanced Centralized Traffic Control simulation inspired by our popular ***Train Dispatcher.*** For those who like a real challenge! Commodore 64 or 128 - $35.

SUPER TRACK BUILDER - Design additional rail territories to augment those provided with ***Super Dispatcher.*** Not a stand-alone program. Commodore 64 or 128 - $20.

LOCOMOTIVE SWITCHER - Railcar manipulation and switching problems in a small industrial yard. Try to minimize damage and maximize efficiency as you move individual cars of a train to their computer-determined destinations. Commodore 64 or 128 - $30.

SONAR SEARCH - The flip-coin of the usual submarine war game. You become the sonar operators in the destroyers pursuing the submarines. Rely on high-resolution graphics and simulated sonar echoes to find, track and destroy the enemy submarines. Commodore 64 or 128 - $15.

COMMING SOON for Commodore 64, 128 --NORTHEAST CORRIDOR - A Centralized Traffic Control program that uses the actual track diagrams and passenger train schedules of one of the most difficult -to-control stretches of track in the U.S. Employs screen displaysand man-machine techniques that are beyond state of the art! Previous customers will be notified via direct mail when ***Northeast Corridor*** is released. Others please watch future ads for ordering and price information.

SIGNAL
COMPUTER CONSULTANTS

SIGNAL Computer Consultants
P.O. Box 18222, Dept. 11
Pittsburgh, PA 15236
(412) 655-7727

U.S.A. & Canada add $2.50 postage and handling ($4.00 foreign) for each product ordered. All checks or money orders must be in U.S.A. funds, all foreign payments must be against U.S.A. banks. PA residents add 6% state sales tax. Visa, Mastercard also accepted; show card number, expiration date, and signature. We guarantee and support our products.

DISCOUNT SOFTWARE and *FREE* Leroy's Cheatsheet

We carry a complete line of software at competitive prices. **PLUS** - on any software package of **$25.00** or more you get a *FREE* **Leroy's Cheatsheet** of your choice! See below for shipping information.

COMMODORE 64

ABACUS
- Basic Compiler 64 $ 30
- Cad Pac 64 $ 30
- Chart Pak 64 $ 30
- Cobol 64 $ 30

ACTIVISION
- Hacker 2 $ 26
- Portal $ 30
- Shanghai $ 26
- Transformers $ 26

ARTWORKS
- Strip Poker $ 22
- Data Disks (each) $ 16

BERKELEY SOFTWORKS
- GEOS $ 42
- Deskpack 1 $ 25
- Fontpack 1 $ 22
- GeoCalc $ 36
- GeoFile $ 36
- GeoDex $ 28
- Writer's Workshop $ 36

BOOKS ON GEOS

Abacus
- Geos inside & out (for GEOS pre 1.3) $ 19

Midnight Press
- How to get the most out of GEOS Disk for bo[illegible]

BRODERBUND
- Carman Sandiego $ 26
- Print Shop $ 29
- Print Shop Companion $ 26
- Grphc Libraries *ea.* $ 18

CHEATSHEET PRODS
- Elite Help Book $7.95
- Label Maker $ 30

CRYSTAL ROSE
- Doodle $30

CSM
- 1541 Alignment Kit $ 33

DIGITAL SOLUTIONS
- Pocker Filer 2 $ 45
- Pocket Planner 2 $ 45
- Pocket Writer 2 $ 45
- Digital Superpack $ 75
- Pocket Dictionary $ 14

ELECTRONIC ARTS
- Chessmaster 2000 $ 30
- Legacy of the Ancients $ 22

EPYX
- Fast Load (cart) $ 30
- P.S. Graphics #1, #2, or #3,(specify) $ 20
- Movie Monster $ 30

INFOCOM
- Leather Goddesses $ 26

MICROPROSE
- Gunship $ 26
- Top Gunner $ 22

PRECISION
- Superbase 64 $ 60
- Superscript64 $ 37
- Superbase *The Book* $ 15

PROFESSIONAL
- Fleet System 2+ $ 42
- Fleet Filer $ 30
- Trivia Fever (limited supply) $ 12

SIMON & SCHUSTER
- Lovejoy's S.A.T. $ 52
- Star Trek-Kobayashi $ 30
- Typing Tutor 3 $ 30

SPRINGBOARD
- Newsroom $ 37
- Clip Art Vol #1or #3 $ 22
- Clip art # 2 $ 28
- Certificate Maker $ 37
- Certificate Library # 1 $ 26

SUBLOGIC
- Flight Simulator II $ 37
- Jet $ 30
- Scenery disks (*each*) $ 16

TIMEWORKS
- Data Manager 2 $ 30
- Partner 64 $ 45
- SwiftCalc w/Sideways $ 30
- Sylvia Porter Fin Plnr $ 37
- Word Writer 3 $ 37

Don't forget to select your *FREE* Leroy's Cheatsheet when ordering a program of $25 or more.

COMMODORE 128

ABACUS
- Basic 7.0 Compiler $ 44
- Cad Pac 128 $ 44
- Chart Pak 128 $ 30
- Cobol 128 $ 44
- Super C $ 44
- Super Pascal 128 $ 44

ACCESS
- Mach 128 cart. $ 37

BERKELEY
- GEOS 128 $ 52

MICROSPHERE
- Cash-in Cash-out $ 59

PERSONAL CHOICE
- I am The C128 $ 27

PROGRESSIVE
- Bob's Term Pro 128 $ 59
- Superbase 128 $ 75
- Superscript128 $ 60
- Vizastar $ 67
- Vizawrite $ 67

PROFESSIONAL
- Fleet System 4 $ 51

TIMEWORKS
- Data Manager 128 $ 50
- Partner 128 $ 50
- Swiftcalc 128 $ 50
- Word Writer 128 $ 50

NEW!!
Easily print on Labels, or Envelopes
Over 500 assorted Labels included
ATTENTION !! Database users: Label Maker™ is compatible with:
Data Manager 2, Fleet Filer,
Super base, EasyScript

for COMMODORE 64 & 128

Label Maker™

Software by Leroy

Advanced program designed specifically for making labels. Pre-designed layouts for 10 different types including: **Std. labels, Audio Cassette, File Folder, Floppy Disk, Micro Disk, Shipping Labels, Rotary Index Cards, Continuous Envelopes, and 2 sizes of Hand Fed Envelopes** . Over ***500*** labels included in package.

DATABASE MERGE - compatible with **Data Manager 128, Data Manager 2, Fleet Filer, Superbase, Consultant & Word Processors such as Easyscript, Paper Clip, or Fleet System.**

only *$30*

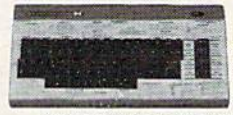
LEROY'S CHEATSHEET ®

Keyboard Overlays

PLASTIC LAMINATED

$7.95 each

For your **COMMODORE 128™**



$3.95 each

For your **COMMODORE 64®**

Put Your Program's Commands Where They Belong - And Your Manuals On The Shelf.

Have you ever sat at your computer with the manual in your lap trying to find an elusive command? How much time have you lost searching through manuals to refresh your memory on how to do what you wanted? Now you have a way to end that frustration - **Leroy's Cheatsheets.**

Leroy's Cheatsheets help you get into your program right away. We put the commands right at your fingertips, actual keystrokes are in **bold** type, variables are shown in *italics.* Designed by software experts, our durable plastic laminated overlays are comprehensive reference aids which document a product or system completely. Now use your software more easily and more effectively. With Leroy's Cheatsheets you'll never have to hunt for a program command again!!!

See below for ordering information.

Order Now and Save ... Money, Time and Frustration

COMMODORE 128 *$7.95 ea*

Please send me the following **LEROY'S CHEATSHEETS** for the COMMODORE 128 for only $7.95 each plus shipping.

DIE - CUT

- ☐ Basic 7.0
- ☐ Blanks (NOT laminated)
- ☐ Data Manager 128
- ☐ Disk 1571
- ☐ Easy Script
- ☐ Elite
- ☐ Fleet System
- ☐ Flight Simulator 2
- ☐ For The Beginner
- ☐ GEOS
- ☐ Multiplan 128
- ☐ Newsroom
- ☐ Paperback Filer
- ☐ Paperback Planner
- ☐ Paperback Writer
- ☐ Paperclip //
- ☐ Superbase 128
- ☐ Superscript 128
- ☐ SwiftCalc 128
- ☐ Word Writer 128

FREE - **Keyboard Extender** (1 per order)

COMMODORE 64 *$3.95 ea*

Please send me the following **LEROY'S CHEATSHEETS** for the COMMODORE 64 for only $3.95 each plus shipping.

CUT-OUT-YOURSELF ON DOTTED LINES

- ☐ Basic 2.0
- ☐ Blanks (NOT laminated)
- ☐ Data Manager
- ☐ Data Manager 2
- ☐ Disk 1541
- ☐ Easyscript
- ☐ Elite
- ☐ Fleet Filer
- ☐ FleetSystem 2
- ☐ Flight Simulator 2
- ☐ For The Beginner
- ☐ GEOS
- ☐ Multiplan
- ☐ Newsroom
- ☐ Paperback (Pocket) Filer
- ☐ Paperback Planner
- ☐ Paperback Writer
- ☐ PaperClip
- ☐ Speedscript
- ☐ Superbase 64
- ☐ Superscript 64
- ☐ SwiftCalc
- ☐ Word Writer

Also fits the COMMODORE 64C

Commodore 64 is a registered trademark of Commodore Electronics Ltd.
Commodore 128 is a trademark of Commodore Electronics Ltd.

☐ ____**Equipment stand(s)** for only ***$19.95*** each
☐ ____**ELITE HELPBOOK** for only **$7.95** each
☐ Program name(s)_____

Name _____
Address _____
City _____ State ___ Zip ___

ORDERING INFORMATION: For fast delivery send cashier's check or money order. Personal & company checks allow 2 weeks to clear. Master Card and Visa orders please include card #, expiration date .Prices and availability subject to change without notice.

SHIPPING:

TOTAL ORDER	Cont. U.S.	APO FPO,AK HI,CAN,PR	INTER-NATIONAL*
UP to $10	$2.00	$2.00	$5.00
$10 - $25	$3.00	$4.00	$7.00
$25 - $50	$4.00	$5.00	* Cheatsheets Only
$50 UP	$5.00	$6.00	

TAXES: Add 6% sales (include shipping) for PA residents only

GAZ 10

HOURS: 8 AM - 5 PM Eastern Monday thru Friday U.S. FUNDS ONLY NO C.O.D.

CHEATSHEET PRODUCTS, INC. **P.O. Box 111368 Pittsburgh, PA. 15238**

Orders only **TOLL *FREE*** 1-800-334-2896 PA Orders - (412) 781-1551 **DEALER INQUIRES WELCOME**

Write for *free* catalog of software and accessories

```
JC 390 CK=CK+Z5*(CK>25):RETURN
QS 400 PRINT"{DOWN}STARTING AT
       [4]";:GOSUB300:IF IN$<>
       N$ THEN GOSUB1030:IF F
       {SPACE}THEN400
EX 410 RETURN
HD 420 PRINT"{RVS} ENTER DATA
       {SPACE}":GOSUB400:IF IN
       $=N$ THEN220
JK 430 OPEN3,3:PRINT
SK 440 POKE198,0:GOSUB360:IF F
        THEN PRINT IN$:PRINT"
       {UP}{5 RIGHT}";
GC 450 FOR I=0 TO 24 STEP 3:B$
       =S$:FOR J=1 TO 2:IF F T
       HEN B$=MID$(IN$,I+J,1)
HA 460 PRINT"{RVS}"B$L$;:IF I<
       24THEN PRINT"{OFF}";
HD 470 GET A$:IF A$=N$ THEN470
FK 480 IF(A$>"/"ANDA$<":")OR(A
       $>"@"ANDA$<"G")THEN540
GS 485 A=-(A$="M")-2*(A$=",")-
       3*(A$=".")-4*(A$="/")-5
       *(A$="J")-6*(A$="K")
FX 486 A=A-7*(A$="L")-8*(A$="
       ")-9*(A$="U")-10*(A$="I
       ")-11*(A$="O")-12*(A$="
       P")
CM 487 A=A-13*(A$=S$):IF A THE
       N A$=MID$("ABCD123E456F
       0",A,1):GOTO 540
MP 490 IF A$=R$ AND((I=0)AND(J
       =1)OR F)THEN PRINT B$;:
       J=2:NEXT:I=24:GOTO550
KC 500 IF A$="{HOME}" THEN PRI
       NT B$:J=2:NEXT:I=24:NEX
       T:F=0:GOTO440
MX 510 IF(A$="{RIGHT}")ANDF TH
       ENPRINT B$L$;:GOTO540
GK 520 IF A$<>L$ AND A$<>D$ OR
       ((I=0)AND(J=1))THEN GOS
       UB1060:GOTO470
HG 530 A$=L$+S$+L$:PRINT B$L$;
       :J=2-J:IF J THEN PRINT
       {SPACE}L$;:I=I-3
QS 540 PRINT A$;:NEXT J:PRINT
       {SPACE}S$;
PM 550 NEXT I:PRINT:PRINT"{UP}
       {5 RIGHT}";:INPUT#3,IN$
       :IF IN$=N$ THEN CLOSE3:
       GOTO220
QC 560 FOR I=1 TO 25 STEP3:B$=
       MID$(IN$,I):GOSUB320:IF
        I<25 THEN GOSUB380:A(I
       /3)=A
PK 570 NEXT:IF A<>CK THEN GOSU
       B1060:PRINT"{BLK}{RVS}
       {SPACE}ERROR: REENTER L
       INE [4]":F=1:GOTO440
HJ 580 GOSUB1080:B=BS+AD-SA:FO
       R I=0 TO 7:POKE B+I,A(I
       ):NEXT
QQ 590 AD=AD+8:IF AD>EA THEN C
       LOSE3:PRINT"{DOWN}{BLU}
       ** END OF ENTRY **{BLK}
       {2 DOWN}":GOTO700
GQ 600 F=0:GOTO440
QA 610 PRINT"{CLR}{DOWN}{RVS}
       {SPACE}DISPLAY DATA ":G
       OSUB400:IF IN$=N$ THEN2
       20
RJ 620 PRINT"{DOWN}{BLU}PRESS:
        {RVS}SPACE{OFF} TO PAU
       SE, {RVS}RETURN{OFF} TO
        BREAK[4]{DOWN}"
KS 630 GOSUB360:B=BS+AD-SA:FOR
       I=BTO B+7:A=PEEK(I):GOS
       UB350:GOSUB380:PRINT S$
       ;
CC 640 NEXT:PRINT"{RVS}";:A=CK
       :GOSUB350:PRINT
KH 650 F=1:AD=AD+8:IF AD>EA TH
       ENPRINT"{DOWN}{BLU}** E
       ND OF DATA **":GOTO220
KC 660 GET A$:IF A$=R$ THEN GO
       SUB1080:GOTO220
EQ 670 IF A$=S$ THEN F=F+1:GOS
       UB1080
AD 680 ONFGOTO630,660,630
CM 690 PRINT"{DOWN}{RVS} LOAD
       {SPACE}DATA ":OP=1:GOTO
       710
PC 700 PRINT"{DOWN}{RVS} SAVE
       {SPACE}FILE ":OP=0
RX 710 IN$=N$:INPUT"{DOWN}FILE
       NAME[4]";IN$:IF IN$=N$
       {SPACE}THEN220
PR 720 F=0:PRINT"{DOWN}{BLK}
       {RVS}T{OFF}APE OR {RVS}
       D{OFF}ISK: [4]";
FP 730 GET A$:IF A$="T"THEN PR
       INT"T{DOWN}":GOTO880
HQ 740 IF A$<>"D"THEN730
HH 750 PRINT"D{DOWN}":OPEN15,8
       ,15,"I0:":B=EA-SA:IN$="
       0:"+IN$:IF OP THEN810
SQ 760 OPEN 1,8,8,IN$+",P,W":G
       OSUB860:IF A THEN220
FJ 770 AH=INT(SA/256):AL=SA-(A
       H*256):PRINT#1,CHR$(AL)
       ;CHR$(AH);
PE 780 FOR I=0 TO B:PRINT#1,CH
       R$(PEEK(BS+I));:IF ST T
       HEN800
FC 790 NEXT:CLOSE1:CLOSE15:GOT
       O940
GS 800 GOSUB1060:PRINT"{DOWN}
       {BLK}ERROR DURING SAVE:
       [4]":GOSUB860:GOTO220
MA 810 OPEN 1,8,8,IN$+",P,R":G
       OSUB860:IF A THEN220
GE 820 GET#1,A$,B$:AD=ASC(A$+Z
       $)+256*ASC(B$+Z$):IF AD
       <>SA THEN F=1:GOTO850
RX 830 FOR I=0 TO B:GET#1,A$:P
       OKE BS+I,ASC(A$+Z$):IF(
       I<>B)AND ST THEN F=2:AD
       =I:I=B
FA 840 NEXT:IF ST<>64 THEN F=3
FQ 850 CLOSE1:CLOSE15:ON ABS(F
       >0)+1 GOTO960,970
SA 860 INPUT#15,A,A$:IF A THEN
        CLOSE1:CLOSE15:GOSUB10
       60:PRINT"{RVS}ERROR: "A
       $
GQ 870 RETURN
EJ 880 POKE183,PEEK(FA+2):POKE
       187,PEEK(FA+3):POKE188,
       PEEK(FA+4):IFOP=0THEN92
       0
HJ 890 SYS 63466:IF(PEEK(783)A
       ND1)THEN GOSUB1060:PRIN
       T"{DOWN}{RVS} FILE NOT
       {SPACE}FOUND ":GOTO690
CS 900 AD=PEEK(829)+256*PEEK(8
       30):IF AD<>SA THEN F=1:
       GOTO970
SC 910 A=PEEK(831)+256*PEEK(83
       2)-1:F=F-2*(A<EA)-3*(A>
       EA):AD=A-AD:GOTO930
KM 920 A=SA:B=EA+1:GOSUB1010:P
       OKE780,3:SYS 63338
JF 930 A=BS:B=BS+(EA-SA)+1:GOS
       UB1010:ON OP GOTO950:SY
       S 63591
AE 940 GOSUB1080:PRINT"{BLU}**
        SAVE COMPLETED **":GOT
       0220
XP 950 POKE147,0:SYS 63562:IF
       {SPACE}ST>0 THEN970
FR 960 GOSUB1080:PRINT"{BLU}**
        LOAD COMPLETED **":GOT
       0220
DP 970 GOSUB1060:PRINT"{BLK}
       {RVS}ERROR DURING LOAD:
       {DOWN}[4]":ON F GOSUB98
       0,990,1000:GOTO220
PP 980 PRINT"INCORRECT STARTIN
       G ADDRESS (";:GOSUB360:
       PRINT")":RETURN
GR 990 PRINT"LOAD ENDED AT ";:
       AD=SA+AD:GOSUB360:PRINT
        D$:RETURN
FD 1000 PRINT"TRUNCATED AT END
       ING ADDRESS":RETURN
RX 1010 AH=INT(A/256):AL=A-(AH
       *256):POKE193,AL:POKE1
       94,AH
FF 1020 AH=INT(B/256):AL=B-(AH
       *256):POKE174,AL:POKE1
       75,AH:RETURN
FX 1030 IF AD<SA OR AD>EA THEN
       1050
HA 1040 IF(AD>511 AND AD<40960
       )OR(AD>49151 AND AD<53
       248)THEN GOSUB1080:F=0
       :RETURN
HC 1050 GOSUB1060:PRINT"{RVS}
       {SPACE}INVALID ADDRESS
        {DOWN}{BLK}":F=1:RETU
       RN
AR 1060 POKE SD+5,31:POKE SD+6
       ,208:POKE SD,240:POKE
       {SPACE}SD+1,4:POKE SD+
       4,33
DX 1070 FOR S=1 TO 100:NEXT:GO
       TO1090
PF 1080 POKE SD+5,8:POKE SD+6,
       240:POKE SD,0:POKE SD+
       1,90:POKE SD+4,17
AC 1090 FOR S=1 TO 100:NEXT:PO
       KE SD+4,0:POKE SD,0:PO
       KE SD+1,0:RETURN
```

COMPUTE!'s Gazette Subscriber Services

Please help us serve you better. If you need to contact us for any of the reasons listed below, write to us at:

COMPUTE!'s Gazette
P.O. Box 10957
Des Moines, IA 50340

or call the Toll Free number listed below.

Change of Address. Please allow us 6–8 weeks to effect the change; send your current mailing label along with your new address.

Renewal. Should you wish to renew your Gazette subscription before we remind you to, send your current mailing label with payment or charge number, or call the Toll Free number listed below.

New Subscription. A one-year (12-month) U.S. subscription to *COMPUTE!'s Gazette* is $24 (2 years, $45; 3 years, $65). For subscription rates outside the U.S., see staff page. Send us your name and address or call the Toll Free number listed below.

Delivery Problems. If you receive duplicate issues of *COMPUTE!'s Gazette*, if you experience late delivery, or if you have problems with your subscription, please call the Toll Free number listed below.

COMPUTE!'s Gazette
1-800-727-6937

Classified

SOFTWARE

SPEEDKIT IMPROVES SPEEDSCRIPT© OR YOUR MONEY BACK! 56% discount & 30 day m.b. guarantee. Blake Lambert's SS 3.0 - 3.2 add-ons (Speedpak,-Mate,-View & 9000 word SpeedCheck dict.) all on one disk. Send $22 +$3 s/h ($6 non-US) to: Upstart G7C, POB 22022, GSO, NC 27420. MC/V ok. (919) 379-9732, 6–10 pm ET. SASE/phone for info. Offer expires 2/1/88

COMMODORE: TRY BEFORE YOU BUY. Best selling games, utilities, educational + classics and new releases. 100's of titles. Visa/MC. Free brochure. RENT-A-DISC, Frederick Bldg. #345, Hunt'n, WV 25701 (304) 529-3232

FREE SOFTWARE for C64, C128, IBM & CPM Send SASE for info (specify computer) to: PUBLIC DOMAIN USERS GROUP PO Box 1442-A2, Orange Park, FL 32067

FREE PUBLIC DOMAIN SOFTWARE - Request free catalog or send $2 for sample disk and catalog (refundable). C64-128 CALOKE IND., Dept. JK, Box 18477, KC, MO 64133

More than 200 great ML routines for 64 and 128, ready to add to your own programs, in COMPUTE! Books' MACHINE LANGUAGE ROUTINES FOR THE COMMODORE 64/128. Explanations, uses, commented source code. 585 pages, $18.95. Check your local bookstore or call (800) 346-6767.

THOUSANDS OF PD PROGRAMS FOR C64/128! We have Games, Utilities, Music and much more! Information write to: Lightspeed Software, POB 7037, Chesapeake, VA 23323

CONTEST SOLVING SOFTWARE. Based on M-W dictionary. All Playoff & Tiebreakers. 2 disks, 3 systems, 45 page manual. Send SASE (no. 10) to: STATGAM, 5668 Chagrin, Mentor, OH 44060

C64 FINEST PUBLIC DOMAIN PROGRAMS Hand picked and tested *On Disk* $1.50 YOU pick the programs that you want!!! For a list and description, SEND SASE to: JLH Co., Dept. G, Box 67021, Topeka, KS 66667

ARB BULLETIN BOARD FOR THE 64/128 300–1200, Punter/Xmodem, Color Graphics, NETWORK, 90 SIGS, 36 Access Levels, Vote, Email, Quiz, SOURCE CODE & MORE! $69.95 (BBS) 718-645-1979 * (Voice) 718-336-2343 L&S COMPUTERS, PO Box 392, Brooklyn, NY 11229

FREE MEMBERSHIP
NO FEES * NO DUES * PD LIBRARY
$5.00 GETS SAMPLE DISK AND CATALOG
QS! ALLIANCE
Box 1403, New Albany, IN 47150

FILE 128 $29.95
Fast C-128 80 column Database Manager.
• Database Templates • Full Documentation • Menu Driven
• Reports • Labels • Bar Graphs • On line help.

TREK 128 $19.95
Full-featured version of a classic computer game. 80 column graphics and sound.

BYTE POWER

MAIL CHECK OR MONEY ORDER TO:
(Add $2 postage/handling)
P.O. Box 80546, San Diego, CA 92138-0546

With your 1520 PLOTTER and C64 you can make professional-looking customized linear graphs in minutes using GRAPH MAKER! Send $15 to DAP, R.R. 2 BOX 67A, Kingman, KS 67068. Specify DISK or TAPE.

FREE APPLE SOFTWARE
Over 100 Public Domain Programs on 50 diskettes. $5 each plus $1 for shipping per order. Send $1 for catalog. Refundable with order.
C&H ENTERPRISES
PO Box 29243, Memphis, TN 38127

SUPER STUD
Expert system play.
Real 7-stud hands. T-shirt if you beat our GANG.C128/64TM
INTRO OFFER SAVE $10
thru Dec '87. Send $29.95
(14 day money back) to
CompuCard Corp, Box 93166
Atlanta, GA 30318. MC/Visa
orders: 1-800-241-8767 x 698
JOIN THE POKER GAME! IDEAL GIFT!

INEXPENSIVE C64/128 ASTROLOGY & NEW AGE SOFTWARE. From $9.95 to $39.95. All print FAST hard copy. Free details. HETTIGER'S, 315 Harmony Ct "B", San Antonio, TX 78217 (512) 599-6000 Visa/MasterCard accepted.

PUBLIC DOMAIN COLLECTIONS! All menu-driven! 5 DS Disks each set. C64 200 games $10, C64 200 util & business $10, C128 200 mixed programs $10. Send to B. C. Keller, 2301 Collins Ave., #A1206, Miami Beach, FL 33139

RENT 64/128 SOFTWARE! 100's of disks. Lowest prices. No deposit or fee. Free catalog. Centsible Software, PO Box 930, St. Joseph, Mich. 49085 (616) 982-0327

CRICKET'S C64 PUBLIC DOMAIN SOFTWARE COLLECTION: Full disks plus program info booklets: Designed for user friendliness with the beginner in mind: Each program fully tested: Specify Vol 1 or Vol 2: $8.00 each: Send ck/mo to Cricket's Computing, 2149 Watkins Rd. SE, Palm Bay, FL 32909

ULTIMA II/III CONSTRUCTION SETS @$20 ea. Character Editor, Map Editor, Map Printer, Clues. R. Trulock, PO Box E430, St. James, NSW 2000, Australia. C64/128 disk only.

HARDWARE

COMMODORE REPAIR/CHIPS. Largest & Oldest CBM Repair Ctr in USA! Low prices on all Commodore repairs (e.g. C64, $39.95 complete). Send for complete catalog on low-cost chips and parts. Kasara Microsystems, 33 Murray Hill Drive, Spring Valley, NY 10977 (800) 642-7634, (914) 356-3131

MISCELLANEOUS

ATTENTION SX64 USERS!
Join the nationwide "USA SX64 Users Group" $15 per year. 10 Cornwall St., Boston, MA 02130. Monthly newsletter and more!

PERSONAL COMPUTER OWNERS CAN EARN $1000 to $5000 monthly selling simple services part time. Free list of 100 best services. Write: A.I.M.I.F., Box 60369, San Diego, CA 92106-8369

Now! **Comdr Qualfd** Repairs! C64:$45, 1541:$50, SX64:$65. BuySellTrade New/Used - Fast Serv!! 30 day wnty! Mom & Pop's Computer Shop, RR2, Box 119, Cainesville, MO 64632 (816) 872-6311

COMPUTE!'s Gazette Classified is a low-cost way to tell over 275,000 microcomputer owners about your product or service.

Rates: $25 per line, minimum of four lines. Any or all of the first line set in capital letters at no charge. Add $15 per line for boldface words, or $50 for the entire ad set in boldface (any number of lines.) Inquire about display rates.
Terms: Prepayment is required. Check, money order, American Express, Visa, or MasterCard is accepted. Make checks payable to COMPUTE! Publications.
Form: Ads are subject to publisher's approval and must be either typed or legibly printed. One line equals 40 letters and spaces between words. Please underline words to be set in boldface.
General Information: Advertisers using post office box numbers in their ads must supply permanent address and telephone numbers. Orders will not be acknowledged. Ad will appear in next available issue after receipt.
Closing: 3rd of the third month preceding cover date (e.g., June issue closes March 3rd). Send order and remittance to: Harry Blair, Classified Manager, COMPUTE!'s Gazette, P.O. Box 5406, Greensboro, NC 27403. To place an ad by phone, call Harry Blair at (919) 275-9809.
Notice: COMPUTE! Publications cannot be responsible for offers or claims of advertisers, but will attempt to screen out misleading or questionable copy.

COMPUTE!'s GAZETTE
TOLL FREE
Subscription
Order Line
1-800-727-6937

advertiser's index

Reader Service Number/Advertiser	Page
102 Abacus	1
103 Abby's Discount Software	131
104 Access Software Inc.	47
105 Accolade	35
106 Accolade	49
107 Acorn of Indiana	136
108 ActionSoft	36–37
109 Activision Inc.	16
110 Aprotek	133
111 The Avalon Hill Game Company	29
112 Balistic Software	23
113 Banana Software, Inc.	128
114 Berkeley Softworks	2–3
115 Berkeley Softworks	50–51
116 Blackship Computer Supply	132
117 Cardinal Software	130
118 Central Point Software	30
119 Cheatsheet Products Inc.	145
Chip Level Designs	143
120 C-More Products	128
121 Commodore	69
122 Compumed	128
123 CompuServe	7
124 ComputAbility	113
125 ComputAbility	115
126 Computer Direct	71–73
127 Computer Mail Order	57
128 Computer Mart	60
128 Computer Mart	122–123
129 Computer Repeats, Inc.	134
130 Computer World	135
131 Cosmi	53
132 Covox, Inc.	148
Crown Custom Covers	132
133 CSM Software, Inc.	136
134 Data East USA, Inc.	55
135 Electronic Arts	IFC
136 Electronic Arts	45
137 Emerald Components International	63
138 EPYX	IBC
139 EPYX	41
140 Eychaner Software Co.	136
141 Free Spirit Software, Inc.	121
142 H & P Computers	81
143 Intelligent I/O	126
Intelligent Software	128
J & K Enterprises	134
144 Ketek	77
145 Logical Design Works	31
146 Lyco Computer	64–67
McGraw-Hill Continuing Education	17
147 Mibro Company	141
148 Micro League Sports Association	59
149 MicroProse Simulation Software	33
150 MicroProse Simulation Software	43
Mindscape, Inc.	39
151 M.C.S.	124–125
152 Modern Photography Video Magazine	83
153 Montgomery Grant	129
154 Origin Systems Inc.	BC
155 Patech Software, Inc.	137
156 P.A.V.Y. Software	134
157 Precision Data Products	130
158 Pro-Tech-Tronics	80
159 Q-Link	12–13
160 Renco Computer Printer Supplies	132
161 S & S Wholesalers	78–79
Schnedler Systems	130
162 Signal Computer Consultants	145
163 Sir-tech Software, Inc.	9
164 Skyles Electric Works	127
165 The Soft Group	132
166 Software Discounters of America	116–117
167 Spinnaker	14–15
168 Strategic Simulations, Inc.	11
Strategic Studies Group	61
169 subLOGIC Corporation	4
170 Superior Micro Systems	132
Tektonics Plus, Inc.	126
171 Tenex Computer Express	139
172 Those Designers	132
173 Tussey Computer Products	25–27
174 Ultrabyte	90
175 Unison World	21
176 Utilities Unlimited, Inc.	75
177 Xetec, Inc.	126

THE AMAZING NEW
VOICE MASTER® Junior

. . . TURNS YOUR COMPUTER INTO A TALKING AND LISTENING SERVANT . . .

$39.95

High-Tech hits again! Voice Master Jr. gives both speech output and voice recognition with this single hardware product! Your voice controls programs, or appliances, robots, and more with spoken commands. Verbal response back gives status, verifies, or requests your reply! Speech output and recognition patterns are recorded into memory with your voice. Programming is simple with new commands added to BASIC. Demo programs get you up and running quickly. A music bonus lets you write and compose musical scores merely by whistling the tune. Unlimited uses for fun, education, practical applications. Speech and recognition qualities the finest available. Truly a remarkable product you will love.

The Covox Voice Master Jr. comes complete with all hardware, software (5 1/4" floppy), and instructions for only $39.95. 30-day satisfaction guarantee. One year warranty. (Add $4 shipping and handling for USA, $6 Canada, $10 overseas.) Available for Commodore 64/128, Atari 800/800XL, 130XE. Specify when ordering. Visa, MasterCard phone orders accepted. Other enhanced Voice Master systems available for Commodore 64/128, Apple II + /IIe/IIc, IBM PC and compatibles.

Call or write today for FREE Product Catalog

COVOX INC. (503) 342-1271

675 Conger St., Eugene, Oregon 97402

COMPUTE! Books' Commodore 64 & 128 Programming Books	89
COMPUTE! Books' Electronic Battlefield and Submarine Commander	87
COMPUTE!'s Sweepstakes	85

CALIFORNIA GAMES.™ BRACE YOURSELF FOR A NEW STATE OF INTENSITY.

Surfing. A sport invented by half-baked Banzais with a fondness for ripping, grinding, and shredding.

It ain't beach blanket bingo. These are radical games. Games that take the honorable tradition of *Summer Games™ I and II, Winter Games,™* and *World Games,™* wax it down and load it on the roof.

Try shredding the face of a totally tubular wave. Join the airforce in a BMX bike race. Screech around on skates and then rocket off the skateboard ramp.

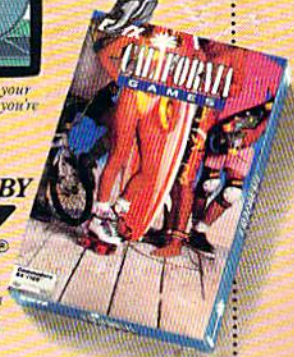
You'll be playing for sponsors like Ocean Pacific, NHS Santa Cruz, CASIO, Costa Del Mar, Kawasaki, and Spinjammer. For trophies and an overall championship.

So get air. Go crazy. Welcome to the state of California.

BMX. Where wheelies are the breakfast of champions. And everyone else eats dirt.

Launch a few feet off the lip with your skateboard tucked high. And while you're up there, dance for the crowd.

Slalom the boardwalk obstacle course on roller skates.



CALIFORNIA GAMES BY

EPYX®

Commodore 64/128, Apple II & Compatibles, IBM & Compatibles, Amiga

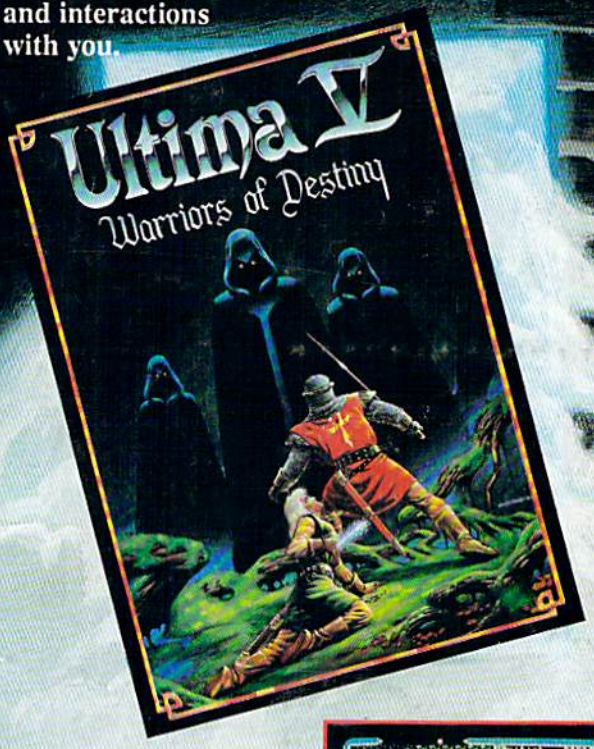
SEE GAME BOX FOR DETAILS ON INSTANT WINNER CONTEST.

The wait is over... but the excitement has just begun.

More than two years in the making, Warriors of Destiny sets the new standard for role-playing games. No other game can offer you as beautifully detailed a world, or as exciting an adventure. Ultima V is the game for all role-playing gamers: Warriors of Destiny will enchant the novice and challenge the expert.

Highlights of Ultima V

- Powerful new combat and magic systems, increasing in sophistication as your skill increases.
- Over twice the graphic detail, animation and sound effects of earlier games.
- Hundreds of truly life-like people who can carry on complex conversations and interactions with you.



Screen displays shown from the Apple™. Others may vary. Allows the use of Ultima IV characters. No previous Ultima experience required.

ORIGIN SYSTEMS INC.

136 Harvey Road
Building 'B'
Londonderry, NH 03053